

A
T R E A T I S E
ON THE
NATURE, ORIGIN AND PROGRESS
OF THE
YELLOW FEVER,
WITH OBSERVATIONS ON ITS TREATMENT ;

COMPRISING

An Account of the Disease

IN SEVERAL OF THE CAPITALS OF THE UNITED STATES ;

But more particularly as it has prevailed in

B O S T O N. 1814

BY SAMUEL BROWN, M. B.

“ Their flesh shall consume away while they stand upon their feet, and their eyes shall consume away in their holes, and their tongue shall consume away in their mouth.”
ZECH. XIV. 12.

“ His breath goeth forth, he returneth to his earth ; in that very day his thoughts perish.”
PSALM CLXVI. 4.

B O S T O N :
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April, 1800.



At a Meeting of the TRUSTEES *of the* HUMANE SOCIETY, *January 6th, 1800.*

THE Committee, appointed the 4th of November last, to examine the Treatises on the subject of the Yellow Fever, made the following Report :

1st. That the Premium, offered by this Society to the person who should communicate the greatest number of facts, relative to the Yellow Fever, lately prevalent in several of the principal cities of the United States, in their advertisement of March last, be, and is hereby adjudged to the Author of the paper marked * * * *. And upon opening the same, it appeared, that SAMUEL BROWN, *M. B.* was the Author.

2d. That the First and Third Part of the Communication above mentioned be published by this Society, under the direction of a Committee, for that purpose to be appointed ; which Report was read and accepted.

Voted, That the President, Dr. Dexter and Dr. Spooner, the former Committee, with the addition of the Rev. Dr. Parker, be a Committee to publish the Treatise, offered for a reward, upon such terms as they shall think proper ; and that the same Committee be, and they are hereby authorized to procure a piece of plate, and present the same to Mr. SAMUEL BROWN, for his acceptance, with a suitable inscription, to the value of *Fifty Dollars*.

An Extract from the Minutes of this Society,

JOHN AVERY, *Secretary.*

THE above Report of the very respectable Committee of the Humane Society confers on me a mark of honourable approbation, equal to my most sanguine expectations, and far beyond the confidence of hope. On this occasion my best feelings are awakened ; and it is with the liveliest gratitude I receive the Premium, accompanying the approbatory sanction : I have only to
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hope, that hereafter it will stand as evidence, **not only** of the willing ability and bounteous intentions of the Society, but also of the propriety of their decisions and justness of their bestowments ; while its quality and value shall be truly emblematic of the purity and munificence of those principles, which bespeak the true Samaritan, and which form the basis of the Institution, justly claiming the appropriate name of *The Humane Society*.

Although there has been no lack of endeavour to render the work as accurate, useful and satisfactory as possible, yet still it may be found deficient in one or all of these particulars : errors no doubt there are, sufficiently numerous to require the exercise of much charity, and an equal share of candour to excuse ; neither of which, however, is solicited ; for they are only desirable or estimable, so far as they are the *spontaneous* effusion of generous and enlightened minds.

It is shortly to meet the public eye ; and should it be productive of utility, equal to what might be expected from the very honourable sanction it has received, the consummation of my happiness will be the result. And even if, in principle and doctrine, it be calculated to preserve *one* blank on the frightful catalogue of death, or shall rescue a single fellow mortal from a premature consignment to the tomb, my apprehensions of envious criticism or uncandid remark are at an end ; they are swallowed up in victory.

Your obliged and humble Servant,

SAMUEL BROWN.

N. B. The extracts from Dr. Mitchill's private letters are entirely without his permission. I could not refrain from deriving that reputation to the work, and instruction to the public, which I am sure they are calculated to afford. It is hoped this will be considered as sufficient apology for the liberty I have taken.

Preliminary.

THE important movements of the present day will form a most interesting and ever memorable epocha in the history of the world ; they will be lasting in their consequences, and extensively influential upon men and things. Perhaps no period was ever more portentous, or more marked with calamitous events. The indications are numerous of a very sparse diffusion of intellectual radiance, and that the moral elements are either confounded in the obscurity of sophistry and error, or enveloped in more than Egyptian darkness. There is scarcely a dawn of light upon the *rational horizon*. Europe is become a theatre of gladiators : the *cut* and *thrust* are the most approved and fashionable tactics at the present day ; and thus it is, that whole territories, instead of being nurseries and abodes of harmony and love, are changed into mere slaughter-houses, where hecatombs of human victims are daily sacrificed and offered up at the shrine of ambition and the love of domination. “ *Spoiling and violence are before me ; and there are that raise up strife and contention.*” “ *I have cut off the nations, their towns are desolate ; I made their streets waste, that none passeth by ; their cities are destroyed, so that there is no man, that there is none inhabitant.*”

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But the work of death is not always performed by legions and battalions : Though the temple of Janus should never be shut, and the whole apparatus of war should be kept in constant employ, still *pestilence* could boast a superiority in the number of its victims. This is a foe, against which neither ramparts nor intrenchments afford any security : “ *It wasteth at noon day ;*” and every principal town, throughout the United States, exhibits recent and mournful testimonials of its ravages. We will not enter upon a particular detail of the distresses which Philadelphia, New York, Boston, and other commercial places have experienced ; the tale of wo would be too afflictive for even the dullest sensibility to bear, and the feelings of humanity would be agonized to over excitement.

To lessen the quantum of human wretchedness ; to widen, as far as possible, the circle of rational happiness, and increase the means of temperate enjoyment, will ever be among the first objects and the leading desire of the benevolent and philanthropic. To this end, and thus truly in accord with the principles and avowed object of their Institution, the Humane Society directed the following advertisement to the public :—

“ AT a meeting of the Trustees of the Humane Society of the Commonwealth of Massachusetts, March 4th, 1799.

“ The preservation of life being the great object of this Society, the formidable epidemic, which has lately made its appearance in the United States, and which threatens with depopulation
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some of our fairest and most flourishing cities, is justly comprehended within the views of the Institution.

“ Therefore, *Voted*, That a piece of plate, of the value of *Fifty Dollars*, be given for the communication of the greatest number of important and well substantiated facts instrumental in giving origin to the Yellow Fever in the *United States*. These may respect the circumstances of importation; the situation of places in which it appeared; the waters used by the inhabitants; the diet and occupations of the persons most affected by the disease; the state of the atmosphere previous to and at the time of its prevalence; together with all such accidental causes, as may have concurred in the generation of the epidemic;—to be stated in concise terms, with the authorities and publications by which they are supported. The communication, for which the above Premium is offered, to be directed and sent to Dr. Aaron Dexter, Corresponding Secretary of said Society, on or before the first of *November* next, without any name or intimation to whom it belongs, but marked in any manner the person sending it shall think fit, accompanied with a paper sealed up, having on the outside a corresponding mark, and on the inside the name and address of the Author. The Trustees pledge themselves not to open any sealed paper, but that which has a mark corresponding to one on the successful communication.

“ *An Extract from the Minutes of the Trustees of the Humane Society of Massachusetts.*

“ JOHN AVERY, *Rec. Sec'y.*”

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I am free to acknowledge, that the following sheets are mostly a compilation, consisting of extracts from different medical authors; this I mention the more readily in this place, as I consider it the best recommendation of the work; for, in my estimation, the work has merit in the same proportion as there is *less* of my own and *more* of others. What really belongs to me is presented in a state of inaccuracy and disarrangement, that demands apology, and which, but for the peculiarity of circumstances I have been in, resulting partly from the business in which I am engaged, would be inexcusable. The truth is—last winter some facts and observations, relative to the fever, were hastily thrown together in the form of a pamphlet; certain portions of which were soon after published in the newspapers, and in the Medical Repository of New York. The intention of publishing the whole work collectively was relinquished. Various avocations and duties took up my attention, and fully employed my time. The subject was without further consideration, until about four weeks ago, when I was induced to resume it: what could from that time be done, is done, and is now submitted to candid inspection and impartial decision.

Boston, November, 1799.



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TREATISE, &c.

THE destructive fever which prevailed in Boston from the latter part of July to about the middle of October, 1798, was not materially different from that which prevailed here in the summer and autumn of 1796. It varied only in the degree or violence of the symptoms; the disease proving fatal generally on the fourth or fifth day after its attack; seldom after the seventh.

The following letter from Dr. Mitchill, of New-York, September 10th, 1798, comprises the general forms and distinguishing features of the disease, and also affords valuable hints respecting the proper treatment:—

“The disease appears to me to manifest itself under several distinct forms, to wit: 1. Symptoms of gastritis, anorexia, vomiting, &c. or of the dysenteric kind, with stools of slime, blood and green gall, &c. This form of the distemper, invading the alimentary canal chiefly, I have found capable of being relieved very happily by *solutions of lime, pot-ash and soda* in water, aided by something cathartic, such as Ol. Ricini, Tart. Solub, Rochelle Salt, &c. to carry off indurated fæces. These alkaline remedies are now much in use here; I have employed them all summer in my hospital practice. Doctors Smith and Miller have had repeated experience of their good effects in the gastric and intestinal forms of the disease; and they allay anorexia, nausea and black-vomiting; I suppose useful

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by neutralizing septic acid, too redundant to be saturated by the bile. Lixiv. Tartar. is my constant remedy for chancres and syphylitic ulcers ; and I find it a good and successful application ; with soap-suds for an injection both in men and women. In my hospital practice, they are my standing prescriptions. Such is the analogy between the poison of plague and that of syphilis. 2. Symptoms of high excitement in the heart and sanguiferous vessels manifest by increased heat, red eyes, dry skin and tongue, thirst, high delirium, full pulse, &c. This is the form requiring blood-letting, and bearing the repetition of the operation to an extraordinary degree in some cases. In some cases of this sort, letting blood is a grand remedy, and perhaps in many instances a *sine qua non of the cure*. 3. Symptoms of torpor, listlessness, coma, low delirium, moderate heat, *little*, and in some instances *no* pain, extreme muscular debility, want of irritability, a destruction of the vis insita, dulness of sensation and perception, yellowness of the eyes and skin in most cases, without pain in the right hypochondrium, shortness of breath, with little or no special disorder either in the blood-vessels or alimentary canal. This train of symptoms forms one of the most insidious modes of the distemper, the patient declaring that little or nothing is the matter with him, although verging fast upon dissolution. In such a dangerous state of the constitution, I have from much observation and much reflection, been led to believe that the *nerves* and *muscles* as well as the *blood* are overcharged with *septon*, and under-charged with *oxygen* ; whence a rationale of the torpor, &c. can be easily deduced. The indication of cure then will be the same as in scurvy ; that is, to introduce oxygen and subduct septon. For I believe, and you will, I think, find it true, that the form of disease now under consideration might, with propriety, be denominated *acute scurvy* in opposition to the *ordinary* or *chronic scurvy*, and receive a suitable treatment. I have prescribed

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neutral mixtures, lemonade, cyder, peaches, pears and apples for several patients, mostly to try whether this idea is founded in fact.

“The foregoing symptoms may be variously blended together, and make a very complicated disorder, with which the physician must get along as well as he can.”

Some physicians have asserted, and many people believe, that a disease of the like nature and form has never appeared or been known till late years. This however is not true; proof in abundance may be had from various writers of natural history, and the diseases of different countries and at different periods of time. The following from Mr. Hughes' Natural History of the Island of Barbadoes is in point. It will be found to have very near agreement with the disease in all its forms as described by Dr. Mitchill.

“The island of Barbadoes is subject to a very malignant fever (though I believe in common with other countries between the tropics) now called the Yellow Fever.

“Dr. Warren, in his ingenious Treatise upon the distemper, concludes it to be a species of the Plague, and that the infection was unhappily brought to Martinico in bales of goods from Marseilles in the year 1721; though others, who have resided much longer in the island, are of a different opinion, especially Dr. Gamble, who remembers, that it was very fatal here in the year 1691, and that it was then called the new distemper, and afterwards Kendals' fever, the pestilential fever, and the bilious fever.

“The same symptoms did not always appear in all patients, nor alike in every year when it visited us. It is most commonly rife and fatal in May, June, July and August; and then mostly among strangers, though a great many of the inhabitants, in the year 1696, died of it, and a great many at different periods since.

“The patient is commonly seized with a shivering fit, as in an ague, which lasts an hour or two, more or less;

less; and the danger is guessed at, according to the severity and continuance of the ague.

“After the shivering fit, a violent fever comes on, with excessive pains in the head, back and limbs, loss of strength and spirits, with great dejection of mind, insatiable thirst and restlessness, and sometimes too with a vomiting attended with pains in the head, the eyes being red, and that redness in a few days turning to yellowness.

“If the patient turns yellow soon, he hath scarce a chance for life; and the sooner he does so the worse.

“The pain in the head is often very great, when first seized with the fever.

“After some days are passed, this pain abates, as well as the fever; and the patient falls into a breathing sweat and a temperate heat, so that he appears to be better; but, on a narrow view, a yellowness appears in his eyes and skin, and he is visibly worse.

“About this time he sometimes spits blood, and that by mouthfuls; as this continues, he grows cold, and his pulse abates, till at last it is quite gone; and the patient becomes almost as cold as a stone; and continues in that state, with a composed, sedate mind.

“In this condition he may perhaps live twelve hours without any sensible pulse or heat, and then expire. Such were the symptoms and progress of this fever in the year 1715.

“Sometimes likewise the patients have profuse discharges of blood by stool, and soon after die; and sometimes likewise at the nose, by which means they have been relieved; but when the blood issues from thence but in few drops, it is a bad prognostic, and is generally the harbinger of death.

“In most of these cases the patients are generally hot and dry; the blood taken from them very red, and scarcely will coagulate; the grume swimming upon the surface of the serum in a thin leaf, having scarce any consistence.

“The patients have likewise often intolerable pains
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in and about the stomach: Sometimes with those pains they shall have a livor, and the plain marks of a sphacelus shall possess the greatest part of the abdomen before they die, particularly the region of the stomach and liver.

“It often happens that the sick person shall lie almost stupid; and being asked how he does, say, he is very well; at other times he labours under the greatest agonies and fits of groanings.

“A loose tooth being drawn from a person who had the fever very severely, there issued out from the hole a great quantity of black, stinking blood, which still kept oozing till the third day, on which the patient died in great agonies and convulsions.

“After death, the corpse of such appear livid in some parts or other; or else marked with pestilential spots, carbuncles, or buboes.

“Without speedy help from the physician, the patient often dies in three days’ time.”

If both of these writers had been practitioners in this town during the prevalence of the fever, and should have given a history of the disease, its progress and symptoms, I cannot think they would have done it with more accuracy, or with closer agreement in point of fact, than in these extracts; although the first is an account of the fever prevalent at New-York, in the summer of 1798; the latter an account of the fever as it prevailed in the island of Barbadoes, 1715.

The disease here assumed precisely the same forms as mentioned by Dr. Mitchell, with only the addition of some cases of Cholera Morbus; these more frequent during the excessive heat in August. The dysentery was most prevalent with the younger class of inhabitants, down to infants.

The second and third forms of the disease were principally confined to the middle aged, and to sanguineous and plethoric constitutions. These two forms, if my observations have been accurate, existed almost invariably in every individual subject where
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the termination was fatal, and after the fourth day ; the second form being only the commencement and first stage of the disorder, which was succeeded sooner or later, according to the violence of the disease, by a second set of symptoms, which make the third form of the disease as mentioned by Dr. Mitchill, and which generally were fatal.

The second set of symptoms enumerated by Dr. Mitchill, were more distinct and common during the month of August, when the heat, perhaps, was never more excessive in this climate for such a length of time : and in many instances these symptoms were so extreme, as to end the life of the patient before the third set of symptoms had appeared. This fatal termination was within forty-eight hours, or on the third day after the attack.

In some patients, the second form of the disease mostly prevailed, more particularly with the middle aged and below ; in others, the disease exhibited only the third form or set of symptoms ; mostly with those above the middle age, and when the weather grew colder.

The ague and rigors were generally the premonitors of the disease. Excessive heat soon came on, and, with the most, continued until a profuse cuticular and intestinal evacuation, and also bleeding, gave relief ; or, till they ended in the death of the patient, with the symptoms of the second form, viz. high delirium, suddenly piercing pains in the head, and also excessive in the stomach and bowels, back and loins : Or, terminating in symptoms of the third form, as noted by Dr. Mitchill, and thus by Mr. Hughes—"The patient grows cold, pulse abates till quite gone ; he sometimes continues in this state 10 or 12 hours, with a composed, sedate mind ; and if he be asked how he does, answers, that he is very well, feels no pain, &c."—And this was most commonly the case after much bleeding from the mouth, either in consequence of too great mercurial stimulation, or occasioned by a dissolved state of the fluids.

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It should be here observed, that even during the greatest vascular excitement and heat, cold chills would sometimes pervade the system, with the suddenness of an electric aura.

The appearance of the blood was various, according to the time of the disease in which it was taken from the patient. I think more coagulable when taken early in the disease, than after. There were frequent instances of uncommon reluctance in the flow of the blood, although the pulse felt strong and full. The blood was in almost every instance dark, and of the appearance of that of persons drowned or strangulated. In some instances, it did not coagulate after remaining in the cup twenty-four hours.

The state of the bowels at the commencement of the disease, was various in different subjects; generally costive. The discharges, after mercury had been freely used, and when excited by cathartics, more especially after giving castor oil, were almost invariably profuse, thin, and almost as dark as ink.

I had myself an attack of the disease, which lasted four and twenty hours before a complete relief. The distress of head was great, occasioned by violent pulsations or bounds of the heart; and as often, as every two or three minutes. It seemed as though the heart was under a constant and violent struggle to propel a sluggish column of fluid, resisting or pressing too hard upon it; and these violent leaps of the heart, which gave a severe and piercing pain in the head, seemed to be the efforts of a collected force to unburthen itself. Over my face was a suffusion, dark, as if of venal, rather than arterial blood; somewhat resembling the appearance in an epileptic paroxysm. I felt those sudden chills of cold which I have before mentioned; also a general lassitude and much reluctance to motion; but had not those severe pains in the stomach and bowels. I took severally two full doses of jalap cathartic, with mercury; used freely, warm diluent and diaphoretic drinks; got into a warmed bed;

bed ; increased the quantity of clothes, applied sliced onions to the axillas, &c. A profuse perspiration came on ; the symptoms subsided, and did not return.

Three subjects dead of the disease, were dissected by Doctors Warren and Rand, of which they published an account, Sept: 8th, and is as follows :

“ The first case was of a man, who died on the sixth day from the seizure ; and as no application was made to a physician, till the first stage of the disease had nearly expired, the state of the organs may be considered in a great measure as the natural effect of the disease, undisturbed by art.

“ In the cavity of the chest, the lungs were remarkably affected ; they contained an uncommon quantity of dark blood, in their vessels, which rendered them apparently more dense than usual ; the vesicles not being distended with air, and their substance consequently less compressible than usual. The posterior part of both lobes was extremely livid, and in the cavities of the thorax, was contained a large portion of extravasated blood, firmly coagulated, to the quantity of eight or ten ounces, as nearly as could be estimated.

“ The pericardium contained as much as two or three ounces of fluid blood. The heart was of its usual size ; but the coronary veins were so distended with blood, as to exhibit the appearance of a most successful injection. In the cavity of the abdomen, the part most conspicuously morbid was the liver. This organ appeared to be much inflamed both on its convex and concave surfaces ; its substance was much indurated, and on cutting, resembled in colour a boiled liver. The gall bladder was contracted to a very small size, and contained not more than a quarter of an ounce of a thick, glutinous, and almost inspissated substance, resembling pitch. There were no marks of any considerable quantity of the bile having been lately contained in the sack, and none of the neighbouring parts

parts had the least tinge that denoted its presence. On cutting through the ductus communis choledocus, no bile issued from the aperture; the hepatic duct had also evidently, for some time, ceased to transmit its fluid from the liver. The stomach exhibited an enormous distension of its veins, especially round the pylorus, and had every mark of great inflammation. The intestines in general were in the same state with the stomach; the smaller were considerably distended, and the larger contracted. The spleen was uncommonly turgid, but in other respects, in a natural state. The peritoneum on the under side of the diaphragm, and the pleura on the upper, bore the vestiges of inflammation, but no other parts of those membranes appeared to have been diseased.

“The omentum was considerably thickened, and from the turgescence of its blood vessels, of a colour unusually dark. There were no appearances in the thorax, or abdominal viscera, of suppuration, nor was any degree of fetor perceived to arise from them; nor was there the least mark of even incipient putrefaction in any part of the body. It may be proper to remark on this case, that in every stage of the disease, the discharges from the bowels were of the colour and consistence of water gruel, excepting a few evacuations of a matter similar to what is called the black vomit; and that this usually fatal symptom had also preceded the patient's death, on the fourth day of the disease.

“The second case.—The subject of this dissection was the body of a person who died on the 12th day from the attack, with symptoms of the mixed kind; a remission of the disease had taken place, at the period usually critical, upon which, on the sixth day, a delirium ensued, and continued to the moment of fatal termination.

“On opening the cranium, the brain was found to have its vessels astonishingly distended with blood, an ounce or two of serum was effused between the dura

and pia mater. Under the sagittal fature, and by the sides of the longitudinal sinus, where the veins terminate in that cavity, a lymphatic band, about an inch wide, extending nearly the whole length of the sinus, was formed by the coagulable lymph, which had been effused from the blood vessels, by the violence of the preceding inflammation, and this substance had served as a medium of adhesion, between the dura and pia mater in that part.

“The lungs adhered very firmly to the pleura on the right side, and appeared posteriorly to have been much inflamed, and in some parts to be indurated, in portions about the size of a pigeon’s egg. The left lobe adhered so firmly to the pleura, as not to be separated but by tearing the substance of the lungs, which here appeared extremely diseased, and in a state of actual suppuration throughout its whole substance. The heart was in its natural state. The liver was much enlarged, and in a state that denoted a high degree of inflammation; the convex surface of the great lobe near the gall bladder exhibiting marks of extravasation, as if violently contused. The gall bladder was full of bile, and the ducts pervious.

“The stomach was nearly in its natural state, but on the inside, the surface of the villous coat, was besmeared with a matter which seemed to be of the same nature with the black vomit, though nothing of this kind had been ejected in the course of the disease.

“The duodenum was much inflamed for several inches from its commencement at the stomach, and the whole tract of the smaller intestines was in a similar state. The urinary bladder was contracted to the size of a pullet’s egg, and its inner coat appeared to have been in a high state of inflammation, the vessels having been distended to such a degree, as to have suffered a rupture, and to have effused a quantity of blood into the cavity of this organ. The state of the lungs in this subject, was probably the consequence,

quence, chiefly, of a previous disease, independent of that which proved fatal. An affection of the lungs had for some time existed, whilst the subject was in other respects in tolerable health, and in the pursuit of his business ; so that a pulmonary consumption would, in all probability, have shortly put a period to his life, had the disease, of which he died, never overtaken him.

“ The third case.—In this instance the disease terminated fatally on the fourth day.

“ Upon opening the thorax, the lungs discovered marks of inflammation, anteriorly, and were extremely gorged with blood in the posterior part of their respective lobes.

“ The liver exhibited marks of inflammation, especially on its concave surface and posterior part ; its texture was altered and of a very dense consistence. The gall bladder was completely obliterated, its coats having coalesced with the contiguous parts, so as to form with them one confused membranous substance. The stomach was externally, to appearance, in a natural state, but its inner coat was covered with black coloured fluid, denominated the black vomit.

“ The colon, in some parts, had been much inflamed, as well as part of the omentum where attached to the intestine.

“ It is worthy of remark, that in both the cases where the gall bladder had been diseased, and ceased to perform its functions ; or where the liver had been rendered incapable of secreting the bile, the body became yellow before death ; whereas in the other, where the bile was found in due quantity, this circumstance did not occur.”

The following description of symptoms and appearances mark the disease in its more malignant form, when the patient dies on the third or fourth day ; sometimes as late as the seventh.

“ After the first indisposition, which sometimes lasts several hours, the disease will become more violent.

lent. There will be a faintness, and generally a giddiness of the head, with a small degree of chilliness and horror. Then immediately will succeed a high degree of fever, great heat, and strong beating in all the arteries of the body, particularly observable in the carotid and temporal arteries; flushings in the face, gasping for cool air, white tongue, but tinged with yellow after the retchings have commenced; excessive thirst, redness, heaviness, and burning in the eyes; heaviness and darting pains in the head, and small of the back, and often down the thighs; pulse quick, generally full and strong; in some cases quick, low, and vacillating; skin hot and dry, sometimes with a partial and momentary moisture; sickness of the stomach from the first, which increases with the disease; and immediately after any thing is taken to quench the thirst, retchings succeed, in which bilious matter is brought up; anxiety with stricture, soreness, and intense heat about the præcordia; great restlessness; heavy respiration; sighing; urine deep coloured, and but little in quantity. This is the first stage of the fever, and many continue 24, 36, 48, or 60 hours, and this constitutes its inflammatory period.

“The second stage begins with an abatement of many of the preceding symptoms, and the rise of others:—sometimes with a deceiving tranquillity, but with perturbation, if the patient should fall into a sleep; then a yellow tinge is observed in the eyes, neck, and breast; the heat subsides, and sometimes with chilliness. But not with that sort of strong rigor, which, when it happens, terminates the disease by sweat, or by copious bilious evacuations, upwards or downwards. The retchings increase and turn porraceous; the pulse flags, but is sometimes high, and sometimes soft; the skin moist and clammy; urine in small quantity, and of a dark croceous colour; the tongue, in some cases, is harsh, dry, and discoloured; in others it is furred and moist; confusion in the head, and sometimes delirium, with eyes glassy. This stage of the disease sometimes continues

continues only for a few hours, sometimes for 12, 24, 36, or 48 hours, but seldom longer.

“It is in the beginning of this second stage when attempts have failed, or have been neglected in the inflammatory stage, that the great struggle is to be made between life and death.

“In the third and last stage of the fever, the pulse sinks and becomes unequal and intermittent, sometimes very quick; frequent vomitings, with great straining and noise in vomiting, and what is brought up now, is more in quantity, and has the appearance of the grounds of coffee, or is of a slate colour; nothing can be retained in the stomach; difficult breathing; tongue black; cold, clammy sweats; eyes yellow, and sunk; yellowness round the mouth and temples, and soon after over the whole body.

“This universal yellowness growing deeper coloured, accompanied by an aggravation of all the other symptoms, is the immediate forerunner of death. Deep respiration; subsultus tendinum; a convulsive kind of sighing; black urine; death-like coldness of the hands, feet and legs; heat still about the pit of the stomach; delirium, and struggling to get up in the bed; faulting speech, trembling, blood oozing from the mouth and nostrils; sometimes from the corners of the eyes and from the ears; vomiting black, bloody cruor; stools the same; livid spots about the body, particularly the præcordia; hiccup; muttering; coma;—*death.*”*

History of the Disease as it prevailed in Boston in the summer and autumn of 1798.

THE first appearance of the disease was in the family of Mr. Stoddard, in Fore-street, near the market-place, June 21st. Mrs. Stoddard died on the third day after the attack. Her daughter was next sick of the disease,

* Mosley.

case, and died within a short time; on the second or third day. Another young woman, and a son, were, with much difficulty, recovered of the disease.

The market-place is a low, sunken part of the town. It is, from situation, the reservoir of every putrid matter, flowing in from more elevated parts of the town, and accumulated by every rain. It is surrounded with docks of stagnant waters, filled with offal and all manner of noxious matters, which, becoming putrid, throw up, at every ebb of tide, a stench very disagreeable to the adjacent inhabitants. Besides, the market-house and stalls are always supplied in abundance, with meats of various kinds, more or less of which will always, in the hotter season of the year, be in a state of incipient putrefaction; and sometimes far advanced. This assists to destroy the salubrity of the surrounding atmosphere, by loading it with animal effluvia, perceivable by the smell, many times, at the distance of an hundred yards or more.

July 21st. Again the disease appeared, on Codman's wharf, an appendage of the market-place, and near Stoddard's wharf, where it first appeared. Seven adults successively, but in a short time of each other, took the disease—all died. For two or three weeks, all the cases of the fever were of persons either stationed in or near the market, or who often frequented this place; and I am informed, that not one of twenty, or upwards, who first took the disease, was recovered.

Fort-hill was the other part of the town, where the disease was most prevalent—on the front and southeasterly part of it, extending along to Liberty-square, and on through Kilby-street to State-street. In these two parts of the town, the matter of the disease seemed to be concentrated, and thence was taken and dispersed through the town, particularly through Fore-street and State-street.

Fort-hill is very much exposed to reflected heat. The western breezes are almost entirely excluded from
from

from the south-easterly sides of the hill ; while these are so inclined as to meet the sun's rays in perpendicular direction.

This hill, from its summit to its base, is underlaid with one entire stratum of clay ; and the soil is thin, which, therefore, being soon surcharged with putrid residua, and these residua, prevented penetrating below the mould, were thrown out in unusual quantities, during the excessive heat of July and August ; which so contaminated the surrounding atmosphere, as to occasion a mortality greater here, than in any other part of the town. Scarce a family escaped. One family lost five persons out of six. And probably the mortality would have been as great in other families, had they not made a timely removal.

In Front-street, which extends from Market-Square, fronting the harbour E. and S. E. quite to the northern extremity of the town, the fever raged through the latter part of August, all September, and a part of October. Some persons were seized of the disease in Cross-street, (an appendage of Front-street) probably from the exhalations of putrid collections in a cellar in this street, which had been gathering for three years, without removal. They were so offensive, that it was necessary to bestrew the cellar with several hogheads of lime, before any person could be hired to clean it. The filth was first removed into the street, where it lay more than a week ; during which time, the person who occupied the house took the fever ; but, being removed, recovered. Four persons of one family, whose circumstances did not admit of their removal, became subjects of the disease, and all died : likewise, and near these, two females of another family died of the same disease.

All along the south-east side of Front-street, there are wharves of various length, from the Town Dock to Hancock's Wharf, between which are extremely offensive docks.

In

In a westerly direction from Front-street, and on the north-westerly part of the town, is the Mill-pond, which is margined by almost the whole extent of Back-street. This pond is the common receptacle of a great number of dead dogs, cats, and smaller animals, besides large quantities of putrid meat, fish, and other vegetables. There also empty the sewers and drains from vaults and cellars of the buildings surrounding this place. This pond was frequently, during the summer, deprived of its waters, and its naked surface exposed to the excessive heat of the sun. The consequence was, the same malignancy of disease among many families adjacent the pond, and along Back-street, as in other parts of the town.

It should here be observed, that, in several of the buildings near the market, (I think on Codman's wharf, and other adjacent wharves) were stored green hides, and some in a high state of putrefaction; so much so, that it was with much difficulty any person could be procured to transport them. They, finally, were offered for almost nothing, to any one who should undertake their removal. A person appeared, took and deposited them in a cellar on Wheeler's Point, where they were soon discovered by their intolerable smell, and ordered to be removed. Accordingly, they were next carried to an opposite shore, and spread upon a point of land to dry. The person thus employed immediately sickened, and died on the third day.

On Fort-hill, likewise, hides to the amount of several thousand were deposited; and, when discovered, were in a similar state as the above. Also, large quantities of spoiled and putrid beef and fish were found in stores and cellars, in and near these places. It will be remembered, that all intercourse and commerce with the French West-Indies were expressly forbidden, by a law of the general government enacted for this purpose: and this might be one cause why such quantities were suffered to spoil and waste.

Some

Some fresh fish, in one of the stalls in Kilby-street, leading from State-street to Fort-hill, were thrown into a barrel or hoghead-tub, to be prepared for pickling. In this state they were neglected for several days, the owner being away fishing. They became very putrid, and, when the owner returned, were thrown into the dock: immediately such an intolerable effluvium arose, as to drive the people in the neighbourhood from their houses and their work. The neighbourhood soon became very sickly, and many died. Several of the families I attended with Dr. Jeffries.

It may be well further to observe, of those parts of the town where the disease seemed to originate, that they are, in situation, low, confined, crowded with buildings, and full of inhabitants; shut out from northern and western breezes, open to the south and east; exposed to the sun's heat, and this greatly increased by reflection and refraction from pavements, buildings, &c.; and on Fort-hill many of the buildings are white, which makes the reflection still greater. The streets are narrow, for the most part dirty, and not unfrequently filthy.

“Multitudes and multitudes of lives are annually sacrificed, in all cities, to the avarice of the original proprietors of lots. The little narrow, dirty houses, kitchens and yards, surrounded with high fences, excluding air and vegetation; all that can dissipate or absorb the noxious exhalations; all that can purify the atmosphere, and refresh the exhausted frame of a human being, panting beneath a sultry sun—every thing in our cities is contrived to *waste the powers of life, and shorten its duration.*”*

The number dead of the disease has been stated at two hundred and fifty: I believe that three hundred is not above the real amount. Perhaps one out of three died: but the mortality varied according to circumstances. (See obituary list.)

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* Webster's Treatise.

The fever prevailed with much malignity till about the middle of October, when it was completely checked by an inundating storm from the north-east, of three days continuance. The atmosphere was much agitated by a strong wind, and so perfectly changed and salubriated, that, after this, the type of the disease was wholly changed. The common bilious autumnal fever succeeded, and was considerably mortal. The last weeks in November, and through the month of December, glandular tumefactions and inflammations, sore throat, and peripneumonic affections, were pretty numerous, and the most frequent complaints : also, in December, there was a considerable number of cases of slow, putrid or typhus fever.

In obstetric cases, during the fever, there seemed to be an unusual tendency to hæmorrhage, or flooding, proving fatal to a considerable number.

With regard to the general state of the atmosphere, I shall only observe, that, during the latter part of July, the whole of August, and a part of September, the weather, perhaps, was never known so uniformly and excessively hot and debilitating ; the winds generally from the south, and surcharged with heat, and often with a clammy moisture. The effect upon the constitution was not unlike what is told of the Siroc wind of Sicily. “During the continuance of this wind, all nature appears to languish ; vegetation withers, the beasts of the field droop, the animal spirits seem to be too much exhausted to admit of the least bodily exertion, and the spring and elasticity of the air appear to be lost ; the pores of the body seem at once opened, and all the fibres relaxed ; the appetite destroyed, and digestion slow, difficult, and much impaired.”

The common atmosphere, for the most part, was opaque and smoky, as if the earth's surface were undergoing a slow combustion. It seemed a heterogeneous mixture of particles, in a state of opposition and propulsion : respiration frequent and unrefreshing.

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The sun, in mid-day height, appeared as a volume of blood, dark and angry. As it declined to the western horizon, its diameter widened greatly; and, at an hour's height, or more, was almost invisible, or shrouded as with sackcloth. These appearances, however, were not constant.

It is found, by experiment with the eudiometer, that the upper region of the atmosphere actually contains a greater proportion of oxygen, and less of azote, or septon, than nearer the surface; and, for this reason; oxygen has a stronger affinity for caloric, concentrated in the sun as its fountain; and because respiration, combustion, putrefaction, and all those processes and mutations of substances, which occasion the consumption of oxygen and superabundance of septon, are always on or near the earth's surface.

In hot seasons and climates, putrid diseases are common, because oxygen, which is the primary recipient of heat, (caloric) or caloric in its first combined or embodied state, is calorified and drawn up into the higher regions of the atmosphere, by which the animal system is deprived of the portion requisite for the processes of animalization. By reason of this deficiency, the carbone, hydrogen, &c. are not duly eliminated and thrown off; the azote is not duly combined, assimilated, and wrought into animal fibre. Thus the materials composing the mass of fluids become more and more heterogeneous, unrefined, and unneutralized; and thus the constitution assumes the tendency or predisposition to putrefaction; this is also assisted by heat or caloric acting upon and pervading the system from without, which, by its great stimulation, deranges the organic motions, making the animal secretions too rapid and abundant, and often superseding them by chemical combinations and processes. Hence the propriety, in order to prevent putrefaction, of using, for food and drinks, such as are in a neutral and unforced state, and which long resist putrefaction in themselves, that the animal powers

ers may not be too much exerted or impeded, having already suffered from the excessive stimulation of external heat. That food is undoubtedly the best, which raises the least internal heat and commotion. It may also be proper to take, as preventatives, such medicines as will invigorate and consolidate the animal fibre, and, at the same time, oxygenate the system.

Active inflammations are complaints which are found to prevail in the colder seasons, and for reasons the reverse of those abovementioned; viz. because oxygen *abounds* in the atmosphere, by which it is homogenized, condensed, clarified, and rendered more elastic; and this, because it is not acted upon, and drawn into the superior regions, by the sun's perpendicular rays. Oxygen being thus concentrated, and brought nearer the surface of the earth, is absorbed by respiration, &c. in too great abundance; its agency becomes excessive; too much is embodied in the animal fibre; the vessels and organs are rendered turgid, and inflammation is the consequence. Hence the reason animal food is more coveted in winter than in summer.

It will be found, I believe, on strict observation, that every epidemic, or wide spread disease, is always preceded by or attended with some peculiar state or temperature of atmosphere; and these phenomena it is of importance to observe and note, when endeavouring to investigate the origin and nature of disease. Thus all the remarkable winds of the tropical regions have their different characters, and also their distinct and peculiar effects upon the human constitution, and upon the animal and vegetable kingdoms; viz. the Monsoons, the Siroc, the Harmattan, the Samiel, &c. They all have precursory tokens, which announce their approach, and by which their effects may be guarded against and avoided: so with strict attention and investigation, the kind and severity of an epidemic might not only be known, but with
certainty

certainly predicted, by ascertaining the kind and quantities of the gaseous acid particles which abound in the different seasons, and which occasion the variation of temperature.

“An epidemic disease may be distinguished from a disease proceeding from infection or specific contagion, by the following circumstances :

“1st. An epidemic pestilence is preceded by influenza, affections of the throat, or acute and malignant fevers.

“2d. An epidemic predominates over other diseases ; totally absorbing them, or compelling them to assume its characteristic symptoms.”* A further consideration of this branch of the subject will be found under the general proposition, *That the disease is neither specifically contagious, nor of foreign origin.*

Now, what is the probable cause of this disease, or what shall we denominate the poisonous matter, so calamitous in its effects on the human constitution, and which has spread desolation and death through many of the most flourishing and populous cities and towns in the Union ?

The account of the disease, as it appeared in this town, which we have given above, plainly shows that it was of local and domestic origin ; that it took rise from an atmosphere vitiated by putrid exhalations, aided by other causes of debility, excessive heat, &c.

C A U S E S.

FROM marsh exhalations and human effluvia, has it been believed from the earliest ages of physic to the present time, that malignant and pestilential diseases derived their origin. Marsh miasmata are always more or less furcharged or commixed with animal effluvia, from the putrefaction of various animals and insects

* Webster's Treatise.

insects that have perished in stagnant places ; so that it will be difficult to draw the line of demarcation between the precise nature of the one and the other. Besides, animal life subsists from vegetable life, and therefore animal substances can only differ from vegetable substances, in that they have sustained the operation of a higher degree of life. The materials in vegetable substances must be the same as in animal substances, only differently apportioned and combined ; the product then by decomposition or putrefaction cannot be essentially different, but only in the proportions of the ingredients. The jail fever, I believe, has invariably been ascribed to human perspiration rendered putrid from heat and confined atmosphere, together with other causes of uncleanness. It would be exceedingly difficult to show the difference between the effluvia of animal substances in the state of putrefaction, and human perspiration rendered putrid, as just stated. Now daily experience still confirms, that it is in the neighbourhood of marshes, and all such places where vegetable and animal putrefaction takes place to any extent, that pestilential and other diseases of various grades and violence prevail. Epidemics, attended with carbuncles and buboes, which are denominated, in conjunction with ordinary symptoms of what is called *jail* and *hospital* fever, the characteristics of the plague, down to the mildest intermittents, have appeared, and raged with extraordinary violence, occasioned by the exhalations from putrefying animal and vegetable substances.

The numerous testimonies of the most judicious writers, shew, that there are few climates where instances have not occurred of malignant epidemic and endemic diseases from these sources. Bengal, on both sides of the Ganges, and Egypt, annually overflowed by the Nile, experience an unhealthy and pestilential atmosphere, immediately after the exhalations from the putrefying collections of vegetable and animal matter begin to arise, which diffusing themselves in
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the air, bring on diseases of various grades of malignancy, according to the greater or less contaminated state of the atmosphere, and other concomitant circumstances. Of Grand Cairo, Dr. Mead observes—"It is situated in a sandy plain, at the foot of a mountain, which, by keeping off the winds that would refresh the air, makes the heat very stifling. Through the midst of it passes a canal, which is filled with water during the overflowing of the Nile, and after the river is decreased, it gradually dries up. Into this canal the people throw all kinds of filth, carrion, &c. so that the stench arising from it, and the mud together, is insufferable. In this situation of things, the plague every year constantly preys upon the inhabitants, and is only stopped when the Nile, by overflowing, washes away the load of filth." Of Bengal thus—"During the rain, this rich and fertile country is covered by the Ganges, and converted as it were into a large pool of water. In the month of October, when the stagnated water begins to be exhaled by the heat of the sun, the air is then greatly polluted by the vapours from the slime and mud left by the Ganges, and by the corruption of dead fish and other animals. Diseases then rage—fevers of the remitting and intermitting kind. If the season be very sickly, some are seized with a *malignant fever*, of which they soon die. The body is covered with *blotches* of a *livid* colour, and the corpse, in a few hours, turns quite livid and corrupted. At this time fluxes prevail." He further observes, that the island of Bombay has been rendered much more healthy than it formerly was, by a wall, built to prevent the encroachments of the sea, where it formed a salt marsh; and by an order, that none of the natives should manure their cocoa-trees with *putrid fish*. He also observes of Bencoolen, in the island of Sumatra, that it is the most unhealthy of all the East India settlements; but that by building their fort on a dry, elevated place, about three miles from the town, it became

came sufficiently healthy. Batavia, the capital of the Dutch East India dominions, (Dr. Lynd) is annually subject to a fatal and consuming sickness: "It has been remarked, that the sickness rages with the greatest violence when the rains have abated, and the sun has evaporated the water in the ditches, so that the mud begins to appear. The stench from the mud is intolerable." Mr. Ives, in his journal of a journey from India to Europe by land, observes, that Gambroon, in Persia, is very unhealthful, and that various authors, as well as the present English factory, "impute its unhealthiness, during the summer months, to the noxious effluvia with which the air is contaminated from the great quantities of *blubber-fish* left by the sea upon the shore, and which very soon become highly offensive." The same writer observes of Basforah, that fifteen years before his visit to this place, the banks of the river Euphrates having been demolished by the Arabs, to revenge an injury done them by the Turks, its environs were inundated. "The stagnating water in the adjacent country, and the great quantity of *dead and corrupted fish* at that time lying upon the shore, polluted the whole atmosphere, and produced a putrid and most mortal fever, of which between twelve and fourteen thousand of the inhabitants perished; and at the same time, not above two or three of the Europeans who were settled there escaped." It is further observed of this place, (Tytler's Treatise) by a gentleman residing there in 1780, "that the canal that runs through a great part of the city being filled with the bodies of animals, and all kinds of putrid matters; and, at low tides, all these substances exposed to the sun, made the air in the town scarce supportable; and, being totally destitute of police, the streets were in many places covered with human ordure, the bodies of dead dogs and cats, &c. which emitted a stench more disagreeable and putrid than any thing he ever experienced." "In all spots, (Dr. Lynd) in the East Indies, situated near large
swamps,

swamps, or the muddy banks of rivers, or the foul shores of the seas, the vapours exhaling from putrid stagnated water, produces mortal diseases." He more particularly mentions, that the *yellow fever* often raged at Greenwich Hospital, in Jamaica, which, he observes, was built near a *marsh*, and could not proceed from any source of infection in the hospital. He every where attributes the *yellow fever* to the vapours arising from putrefying vegetable and animal substances. Dr. Clark, in his "Observations on the diseases of long voyages to hot countries," mentions a *contagious malignant fever*, which prevailed at Prince Island, in 1771, produced from the exhalations of putrefying vegetable substances.

The plague, which caused so great terror and mortality in London, 1625 and 1636, according to the account given of it by Mr. Woodal, surgeon to St. Bartholomew's Hospital, and surveyor-general to the East India Company, who was present the two years it prevailed there, was evidently generated in that city, from causes similar to those already related. He says—"The terrestrial causes (after mentioning it as a punishment inflicted on mankind for their sins) are, by common consent of most writers, as followeth; venomous, stinking vapours, arising from standing ponds or pools, ditches, lakes, dunghills, sinks, channels, vaults, or the like; as also, unclean slaughter-houses of beasts, dead carcases of men, as in time of war, and of stinking fish, fowl, or any thing that hath contained life, and is putrid; as also, more particularly in great cities, as London, the unclean keeping of houses, lanes, alleys, and streets: from those recited, and the like infectious venomous vapours, by warmth of the sun exhaled, are apt and able to infect the living bodies of men, and thereby to produce the plague, as experience too much sheweth."

According to Dr. St. John, the æriform fluid, which is exhaled from animal bodies in a state of putrefaction, acts at certain times more powerfully than at

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others,

others, and is indeed in one stage of the process infinitely more noxious than any other elastic fluid yet discovered. Dr. St. John informs, that he knew a gentleman, who, by slightly touching the intestines of a human body, beginning to liberate this corrosive gas, was affected with a violent inflammation, which in a very short time extended up almost the entire length of his arms, producing an extensive ulcer of the most foul and frightful appearance, which continued for several months, and reduced him to a miserable state of emaciation. He mentions, also, a celebrated professor, who was attacked with a violent inflammation of the nose and fauces, from which he with difficulty recovered, by stooping for an instant over a body, which was beginning to give forth this deleterious fluid. Hence he infers, that the same gas, *modified*, or *mixed*, or *united* with others, may be the occasion of the *plague*, which has so often threatened to annihilate the human species.

In the war of 1775, in Germany, a destructive fever prevailed, attributed then to an infection of the air by the putrid effluvia from the vast numbers killed in battle, and also to a calm in the atmosphere for a long time.

Pringle, Jackson, Hume, Mosely, McLane, and a number of other medical writers, ancient and modern, might be cited, in proof that effluvia, from animal and vegetable putrefaction, may give rise to, and are the common causes of, malignant and pestilential diseases. But there is no occasion for consulting books, knowing the opinion of any, or going abroad for confirmation of what has been advanced respecting the origin of malignant diseases. Our own observations, and the evidence of our senses, are quite sufficient to convince, I must not say *all*, that they do not arise from any other cause, so far as any material agent is concerned. Dr. Reynolds, (Webster's Collection, p. 197) states a case of fever in a young woman, evidently excited by the effluvia of a putrid carcass, lying on
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the borders of a marshy piece of ground, where she was obliged frequently to pass and repass. She was at first affected with violent pains in the head, and sickness at her stomach. On the second day she was bled; but her fever increased, and she became delirious: a number of blisters, surrounded by inflammation, appeared upon her feet and hands, fingers and toes; she died on the fourth day. Dr. Bayley, in his Treatise on the epidemic of New-York, in 1795, states a case of fever produced from the exhalations of vegetables in a state of putrefaction. The cause was detected from an unusual and offensive smell, which proceeded from the cellar. Two persons went down to examine, and found, in one corner of a small tight room, a quantity of June cabbages, on which the sun had shone about three hours in a day; they were rotten, and had fallen down in a lump of putrefaction. On being stirred, there immediately issued forth such an intolerable stench, as obliged those in the cellar to quit it instantly. Vomiting came on, which lasted nearly an hour. Three persons in the family were taken with all the leading symptoms of the yellow fever.

The malignant epidemic, or yellow fever, which prevailed in the summer of 1797, in Providence, Rhode-Island; in 1795, in Norfolk, Virginia; in New York the same year, and in every year it has prevailed there since; in Philadelphia,* in 1793, and the subsequent years; in Newbury-Port, in 1796—if we may give any credit to the accounts of the disease in those places, from men of the first respectability, and distinguished for literary and professional eminence, evidently took their origin from gasses exhaled from vegetable and animal substances collected together, and

* In the opinion of Dr. Rush, the disease is invariably the offspring of putrid exhalations from vegetable and animal substances; but is epidemic only in hot climates, or in the hot seasons of colder climates. These noxious exhalations are thrown out, and the disease produced, 1. From the docks. 2. From ships at the wharves. 3. From the common sewers. 4. From the gutters. 5. From dirty cellars and yards. 6. Privies. 7. From putrefying masses of matter lying in the neighbouring part of the city. 8. From impure pump-water.

and rendered putrid on exposure to a moist and heated atmosphere. The disease in this town, both in 1796 and 1798, was clearly from this cause, and could not, with any propriety or reason, be ascribed to any other source, as will appear from the history already given of its origin and progress. It is useless and unnecessary to add to the number of facts already stated, though this could very easily be done, for they are to be met with in all directions, and to be found in almost every treatise on this subject. Those already related sufficiently confirm, that the greatest degree of vitiation which the atmosphere manifests, by its operation upon the constitution, proceeds from the effluvia emitted from certain animal and vegetable substances during putrefaction. And as far as the innumerable facts on this subject have been collected and examined, there exists the most cogent evidence, that the products just named are the real matter and cause of all malignant or pestilential diseases, in combination with other circumstances, inclining or predisposing the constitution to disease. What was the precise nature of these exhalations, and *which* the particular noxious gas, had only been guessed at and conjectured, perhaps not even this, until Dr. Mitchill, professor of chemistry, natural history and agriculture, in Columbia College, engaged in an investigation of its properties. He discovered it to be a portion of septon* (azote) the offspring of putrefaction, united chemically with more or less of oxygene, (the acidifying principle) in the form of septic (nitric) acid. On the formation and presence of this compound, it is presumed pestilential and malignant diseases depend: And in proportion as a greater or less quantity of the above compound is formed; in proportion

* Dr. Mitchill's Nomenclature.

Septon, for azote or nitrogene.

Septous gas, for azotic gas, or atmospheric mephitic.

Gaseous oxyd of septon, for diphlogisticated nitrous air.

Septic gas, for nitrous gas.

Septous acid, for nitrous acid.

Septic acid, for nitric acid.

Septate, septite, for nitrate, nitrite, &c.

portion to its sparse or concentrated state ; in proportion to the length of time, the susceptibility of the constitution to be operated upon, and the circumstances under which it is applied, will the disease, depending upon this cause, be more or less violent, and attended with various pestilential symptoms.

History of the Production, Nature, Properties, and Effects of the Septic Acid.

According to Dr. Mitchill, and the several medical gentlemen, who professedly advocate and support his theory, septon, the base of the acid of putrefaction, or septic acid, is one of the most abundant elements in nature, and is the peculiar product of vegetable and animal putrefactions : this is proved by experiment. It is produced in much greater abundance from animal substances. Fourcroy asserts, that “animal substances differ from vegetable substances, in putrefying more easily and more speedily, yielding much more azotic (septic) gas.” Septic gas is a combination of septon with caloric, (the matter of heat;) this gas makes up nearly three-fourths of the atmosphere. It is incapable of supporting animal respiration, or combustion, while it makes a part of the nutriment or food of plants, which have the power of decomposing and retaining it ; and thus it becomes a constituent part of their substance. Dr. Mitchill supposes, and the opinion seems to be confirmed by the experiments of Eagleton Smith, that septon enters into the composition of all poisons or contagions. “From chemical combinations of these (septon and oxygene) acting upon different parts of the body, seem to spring the common symptoms of fevers, dysenteries and plagues. And thus a clear idea can be entertained of the nature and composition of *common infection*. But, as there are some distempers of a nature
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ture that have been called *specifically* contagious, their constitution may be conceived, by supposing the matter of small-pox, for instance, to derive its peculiar quality from a commixture of carbone with the matter of ordinary contagion; that of syphilis to arise from phosphorus, blended with the septon and oxygene; that of measles, from a combination of sulphur; that of pertussis, or croup, from the addition of the unknown radical of the muriatic acid, forming a nitro-muriatic oxyd or acid vapour, &c.; and, in like manner, may conjectures be found about the poisonous matter of rabid and other animals."

Septon, in combination with oxygene, the principle of acidity, forms the gaseous oxyd of septon; (dephlogisticated nitrous air;) 2. septic (nitric) gas; 3. and 4. septous and septic (nitrous and nitric) acids; and 5. septic acid gas. In the first of these forms, that of the gaseous oxyd, in which the acidifying principle is so small, as not to manifest the smallest degree of acidity; it is capable of supporting combustion, but is highly deleterious to the lives of animals, which it destroys the moment they are surrounded by an atmosphere of this kind. (2. and 3.) The next degrees of combination of oxygene with septon, are septic gas, and septic acid gas, which are never found to exist in the atmosphere for any considerable length of time, being artificially produced. (4. and 5.) The highest degree of combination and concentration of septon and oxygene, form the septic acid and the septic acid gas, which is their most common form of combination.

Septon and oxygene are the principal ingredients of the common atmosphere, when in a state most conducive to the preservation and vigour of both vegetable and animal life; but in the constitution of the atmosphere, and in the formation of the septic acid, the relative quantities of each ingredient are very different: four parts of oxygene, and one of septon, chemically combined, form septic acid; while
twenty-seven

twenty-seven of the latter, and seventy-three of the former, constitute atmospheric air. In the formation of atmospheric air, besides, septon and oxygene are not chemically combined; they are diffused through and mixed with each other, like clay and water. Their chemical union is prevented, by their greater attraction, separately, for caloric than for each other. Were not this the case, and if "these two substances (says Dr. Bedoes) were not, by some circumstances, prevented from closely uniting, all the oxygene, with a part of the azote, (septon) would be changed into a highly concentrated acid, and the water of our globe would be concentrated into aquafortis," (septous acid.)

The septic acid and septous gasses, thus formed, have a most powerful operation upon a great variety of substances, of both the mineral and vegetable kingdoms, as also upon animal nature. Iron, in particular, is corroded and consumed by it; to this, when much diffused in the atmosphere, are many of the maladies of plants ascribable. Such was the condition of the atmosphere, during the sickness at New-York, 1798; so much was it furcharged with noxious acid gasses and vapours, that the iron railing, in the front of houses, was covered with a thick and unusual coat of rust; and the smooth and bright parts of the pump-handles in the streets were, during a few hours of rest in the night, exceedingly corroded by every drop of moisture which fell upon them. The leaves of trees, on which this corroding moisture had settled, often became spotted; and these spots, before any frost had appeared, turned to mortification. At this time, white cotton garments, spread to dry after washing, acquired such stains and spots by being suffered to hang out during the nights, when this mist prevailed, as to be indelible afterwards, by twice boiling in alkaline lie. These effects of poisonous atmosphere were discovered to take place even in the most elevated and healthful parts of the city. A saline efflorescence, supposed

supposed to be nitrous, was observed on the pavements of many places, particularly Front, Water and Pearl streets. (Med. Rep. vol. II. p. 214.) What is here stated of New-York, was true of this town, Boston. The iron railing, in front of the crescent row of the tontine buildings, was rusted in a similar manner; and the saline efflorescence, mentioned to have been seen on the streets in New-York, almost covered the walls of these brick buildings, the height of several feet from the ground, and in spots over all the shaded sides of those buildings.

The septic acid, generated by putrefaction, is always on the earth's surface, and its vapours never rise to a great height above it. From these exhalations, the water of dews, mists and fogs, precipitated when the atmosphere is cooled, particularly during the night, receives a portion of the same acid, which, thus united, attach themselves to animal and vegetable bodies, and in this manner produce the effects we have just stated. This also accounts for the deleterious effects of fogs and night airs, in warmer latitudes, so often noticed by different medical writers, and which are said sometimes instantly to destroy human life. One night's exposure is often fatal.

The timber and metals of ships, used in the transportation of grain, particularly wheat, are found to be peculiarly subject to decay; and because the grains of wheat, getting below the flooring, putrefy; thus septon is furnished, which, in union with oxygene from the air or water of the vessel, forms the septic acid; immediately the work of destruction commences upon the timbers, bars and spikes of the vessel, till nothing but rot and rust remains. By the putrefaction of this substance, or such as contain the septic base, it is supposed, and very probably, many of the diseases of seamen are originated.

Metals rust, and wood decays, much sooner on and above the surface of the earth, than below it; because septic acids are only formed where atmospheric air and heat can have access.

From

From the softer and more perishable parts of animal bodies, an acid liquor is formed, which is capable of breaking down, or eating away, the texture of the most compact and durable. Thus, both in the grave and the dunghill, by the operation of the acid of putrefaction, the firmness of bones and teeth is dissolved, as it expels the acid of phosphorous, and associates itself with their calcareous basis, in the form of calcareous nitre, (nitrate of lime.) Thus the tougher compages of horn is, by slower degrees, made to yield to the same powerful menstruum : in like manner, the skinny parts of animals, whether crude or tanned, lose their cohesion by the destroying effect of this offspring of corruption ; the accelerated corruption of shavings, straw, and rags of linen, cotton and wool, added to animal manure, leaves little or no doubt, that their more rapid disorganization, in such cases, proceeds from the nitric (septic) acid, by which they are penetrated. Such seems to be the operation of septic acid, concurring with other causes, in breaking down the nicely wrought and firmly fabricated works of animated machinery. And every other thing would be obliged to yield to its rapacity and violence, had it not been so provided, that this arch destroyer should become glutted with conquest, and thus unable to pursue the work of destruction any longer.

The substances capable of coercing and restraining these active and volatile materials, and preventing their ravages upon animal nature, as also upon things of the vegetable and mineral kingdoms, are, all the various species of alkalies, and calcareous earths, or lime ; likewise, all the variety of neutral salts, formed of a weaker acid than the septic acid. Accordingly, we find the plaistered walls of houses, jails, hospitals, and other buildings, often surcharged with this acid, by which it has been absorbed and neutralized. From these materials, nitre or salt-petre (septite of
F pot-ash)

pot-ash) may be obtained in great abundance; in-
 so-much that a body corporate, in Paris, obtained
 license to take away as much of the old mortar of the
 walls of houses, torn down, as they pleased, for the
 express purpose of making nitre. The walls of the
 prison at Olmutz, where La Fayette was confined,
 were covered with salt-petre, or super-saturated with
 the septic acid, which most probably occasioned the
 severe sickness he endured, and that of his wife and
 two daughters, while in this place of confinement.
 A discovery, which Dr. Mitchill made himself, in the
 city of New-York, comes in very well here, and proves
 very fully the strong attractions which the alkalies
 have for the septic acid. On the outside of the wall
 of a kitchen was an ash-house, and in the side a closet;
 nothing separated the ashes from the closet, but this
 wall, which was thin, and of brick; they were so
 porous, that, in the course of time, a saline efflores-
 cence was observed on the bricks within the closet
 near the floor. On examination, the pot-ash, which
 had apparently penetrated through the wall, in a state
 of solution, was found to be changed to nitre, by
 combination with septic acid, which it had doubtless
 attracted from the air of the room. And in this
 way, he observes, is a considerable portion of the mis-
 chief prevented, which would be caused by such nox-
 ious steams, if left to float about at large. (Page 348.
 vol. II. Med. Rep.)

Grounds frequently trodden by cattle, and impreg-
 nated with their excrements; the walls of slaughter-
 houses, and the like, where exhalations from putrid
 animal and vegetable substances abound; as well as the
 formation of nitrous earths at the bottom of graves,
 and where animal bodies have decayed, show that
 earths and soils have an attraction for, and unite with
 this acid, and its vapours. Now, if it be true, that
 septic vapours have the power of producing the dis-
 eases that have been ascribed to them, then those
 countries and places, where the soil is composed of
 those

those substances and materials, which have an affinity with these gasses, and which, attracting and neutralizing them, destroy their virulence, will be found the most healthy. On the Ohio, and most of the Western Territory, many parts of England, France, &c. and some of the West India islands, whose soil is underlaid with calcareous strata, or lime-stone, are instances in proof; these places are healthy, and free from epidemics.

Dr. Casta, an intelligent Portuguese physician, and lately or now in this country, as an official character, describes the city of Lisbon as more accommodate to the generation of filth, and the accumulation of noxious animal and vegetable materials, than to the convenience or comfort of the inhabitants; its streets narrow, not well arranged, and the buildings high; but being built principally of calcareous stone, which attract the septic acids, it is very much exempt from epidemic diseases, except those parts of the city, where the buildings are of different materials, (other local circumstances being less favourable to health) there malignant diseases frequently appear. (Med. Rep. vol. III. No. 1. p. 1.)

Clay has but a feeble attraction for the septic acid. Soils, underlaid with strata of clay, are very subject to intermittent fevers, as almost every one must recollect; and if the season is uncommonly hot, and the atmosphere inflammatory, these diseases assume a very high degree of malignancy. It has been often remarked, and there is much truth in it, that fertility of soil and diseases are frequently concomitants; the reason is obvious, from what has been stated. In general, then, it is asserted, and both experience and observation verify the fact, that where the atmosphere possesses vital air enough to support the life of animals, and is not infected with such a quantity of septic and pestilential vapours, as to induce sickness, such a state of atmosphere seems best adapted both to the convenience and health of plants and animals. But in situations

ations where the soil, over rich with moist and putrid materials, exhales its septic and unwholesome steams, thence agues, fevers, and plagues are excited, and there it is that vegetation goes on vigorously ; while, on sandy, mountainous and rocky places, where only small quantities of putrid substances can collect, where the atmosphere is not at all poisoned with their exhalations, but the respirable portion of it is unusually large—in such circumstances plants thrive but poorly, and diseases are rare.

“ The *septic poison*, (venim septicque) says Arthaud, (Description de l’Hôpital General du Cam. p. 12.) which rises after the fall of the autumnal rains, in the island of St. Domingo, sometimes almost suddenly destroying the vital principle ; at others, forming foul and gangrenous ulcers, and by its unconquerable malignity, causing wounds to resist all manner of remedies ; and then again discolouring the skin ; or, obstructing the mesenteric glands, keeping up a slow fever, inducing emaciation, and finally exhausting the strength, by a serous flux : this æriform venom brings on their plagues or malignant fevers, which, though of local origin, are generally said to have been imported in ships from the coasts of Africa.” But now, more particularly, respecting its

Action and Effects on Animal Life, particularly upon the Human Constitution.

Pestilential vapours, generated as they undoubtedly are, in great profusion, in cities, fleets and armies, (places favouring putrefaction, and the accumulation of filth of every kind) having either overcome those restraints in nature, wisely provided to counterbalance their power, and assuage their ravages ; or, not meeting with these, rise from their putrid masses and filthy matrices, and are diffused in all their abundance through the atmosphere of those places ; and thus,
surrounding

surrounding the bodies of men, and filling their habitations, soon commence their destructive influences. They may be either taken in by respiration, mixed with the saliva, and conveyed into the stomach, and applied to the internal organs; or, they may be generated in the alimentary canal, by the putrefaction of animal and vegetable substances taken as food. The food is prevented from too sudden putrefaction, by the saliva, gastric liquor, pancreatic juice, and bile, which, mixing with it, dissolve and prepare it for the various purposes it is intended to serve. As long, then, as the stomach secretes its liquors in healthy and due quantities, will its contents be kept in utter impossibility of forming the septic poison. But when these preventatives are entirely suspended, or weakened, from debilitating causes, such as the too liberal use of spirituous liquors, excessive heat, fatigue, or from any other process, by which its healthy functions are destroyed or impaired, then it is evident that the food will be liable to corrupt, and the products formed from these materials, within the stomach and intestines, similar to those which obtain without the body. A source of poisonous effluvia seems thus to exist in our bodies; and, from its stimulant qualities, the occurrence of nausea, burning pain, and excessive vomiting, together with other symptoms of gastritis, will not be difficult of explanation.* To this cause, whether generated in the *primæ viæ*, or taken in from a vitiated atmosphere, when applied to the intestinal canal, are diarrhæas, dysenteries, and cholera morbus, diseases

* "Mr. Prior, the inspector-general of beef and pork, in this Commonwealth, (New-York) during the summer and autumn of 1799, examined several thousand barrels of provisions, in various states of decay, partly from the bad quality, and partly from the scanty quantity of the Muriate of Soda, (sea-salt) with which they were pickled, he and his assistants amounted, in the whole, to *forty persons*; they all observed, when beef began to putrefy, it always turned *sour*. *This acidity could be both smelled and tasted*. When it insinuated itself into cuts and scratches on their hands, it caused them to inflame, and be difficult to heal. And out of *forty*, so exposed to the acid fumes of corrupting beef, *thirty-eight* were affected with dysentery, attended with more or less of fever, nausea, and catarrh."

(MS. Letter from Dr. Mitchell.)

diseases of the same genus, only differently modified, referable. The inflamed state of the stomach, duodenum, and lower parts of the intestinal canal, and the black, gangrenous and mortified spots, are all owing to the operation of this acid, which, in some cases, may acquire a higher degree of malignancy than common, by uniting with a larger portion of oxygene. The coffee-coloured matter, commonly called *black vomit*, ejected in what are called bilious *remitting* fevers, seems to owe its colour to a mixture of this acid, as appears from its stimulant nature, noticed by dissectors, with a quantity of bile and blood, which is poured out of such vessels as have their coats destroyed by this poison.

On the application of these pestilential fluids, which have been considered the cause of the diseases mentioned, to the bodies of men, which it may completely surround in some cases, is it presumed, are the various eruptions and petechiæ, so common in fevers of the worst type, to be explained; and not often to be referred to critical depositions of humours from the blood. These affections will put on different appearances and malignancy, in proportion to the concentrated state of the poison, the constitution, and parts to which it is applied. From the disposition of this acid to adhere to bed-clothes and bedding, of which there are innumerable instances, it will readily appear how these pestilential eruptions are produced, especially on those parts that are kept constantly covered, as the back, loins, &c. which are thus continually surrounded by an atmosphere of contagious vapours. The skin, thus beset by this fluid, whose particles seem to inhere in its pores, becomes inflamed, and puts on this morbid appearance. The yellow colour of the skin, in some cases of highly contagious diseases, seems to depend upon the same cause, and is not an absorption of the bile, as has been supposed by writers on bilious remitting fevers. If these changes of colour in the skin were really owing to absorbed

or

or to regurgitated bile, the colour of the urine in these cases ought to be deeply tinged with this fluid, and the feces to put on an ash-coloured appearance, as in jaundice ; but none of these appearances are observed to take place in the fevers, where this pretended absorption is alleged. Besides, it is well known, that such parts of the skin, to which this poison is artificially applied, will put on a yellow appearance, resembling that which is observed to take place in what is called yellow fever.

This acid, in a vaporific form, does, no doubt, sometimes enter the trachea, with the air in respiration, where it may inflame and destroy the parts with which it comes in contact ; and, in its passage to the lungs, if in a concentrated form, may occasion sudden death. In this manner may the sudden extinction of life, in persons exposed to the contagion of the plague, as observed by Ruffel, be accounted for. If this gaseous fluid be inspired in such a diluted state, as not to occasion immediate death, it may cause catarrhal affections, anxiety, coma, suffocation, &c. depending on the sparse or concentrated form, and circumstances under which it is applied. When mixed with atmospheric air, and taken into the lungs, it will not serve the purposes of respiration, as but a small portion of vital air will be decomposed, owing to the large quantity of non-respirable air which is taken in. The heat of the body must thereby be lessened, and the contractions of the heart and arteries become more slow and feeble. In this way may the purple and blackish spots, of persons dead of fever, occasioned by this acid and its oxyd, and the livid and dark colour of the skin, attended with coldness during life, be accounted for ; the lungs not being able to restore to the system its usual and necessary supply of oxygene. Hemorrhages, debility, and prostration of strength, together with want of cohesion in the solids, might all be explained upon the same principle, the muscles being deprived of their usual quantity of oxygene, and overcharged with septon.

If

If this acid be formed in the stomach and intestines, or taken in by the saliva, and applied to the mouth, fauces, cuticular and pulmonic surface, it will most probably be taken up by the absorbent vessels of the skin and pulmonic organs, or absorbed by the lacteals of the intestines; and in this way the blood is contaminated.

The acid sweats, thrown out from the poisoned mass of blood, by means of the small exhalent arteries, in malignant and pestilential diseases, forming the matter of infection, and adhering to the bed-clothes and linen, which, by its corrosive qualities, it destroys and rots; and, if excreted in any considerable quantity, so commonly relieves the patient, (inasmuch as the volume of poison, contained in the arterial system, is thereby lessened) shews that the blood, in certain diseases, contains something of a noxious nature. The appearances also, which blood, drawn in pestilential fevers, puts on, correspond with that in which septic gas had been artificially injected. Blood, thus infected with this poison, taken up by the absorbent vessels, will be carried the round of circulation, and will continue to stimulate the heart and arteries, wearing out their excitability, and, consequently, bring on death, if the constitution be incapable of becoming habituated to its stimulus, or a part, or whole, of the stimulus be not subducted. If it be present in any great quantity, it may cause a sudden extinction of the vital principle, as is observed sometimes to happen in highly pestilential diseases.

The abovementioned compounds, when absorbed by the lymphatics, may inflame them, and cause obstructions, indurations, and even suppuration, of those glands through which they pass, as is commonly observed to take place in the inguinal and axillary glands, in the plague, and other diseases produced by a pestilential state of the atmosphere, where it is absorbed in a highly concentrated form. Instances have occurred, where the lymphatics of the hand, on this extremity

tremity being wounded, in dissecting bodies, in which the septic acid appears already to be formed, were highly inflamed, and could be readily traced from the part where this fluid had been applied, in their course to the glands in the axilla, in which subsequent inflammation took place.

A N T I D O T E S.

THE first which I shall mention, are the natural ones—the gastric liquor and the gall. Many pathologists have supposed, that the gall, or the bitter of soda, (for soda is an ingredient of the bile) promotes putrefaction in the intestinal canal, and thereby was the cause of much febrile mischief; but experiments, by Dr. Saunders and others, prove the contrary; and that it is really a grand preventative of the very evils it has been accused of producing. Its alkaline qualities show, that it is well calculated to check putrefaction, and quell a redundant acid in the first passages. The yellowness of the skin, in certain pestilential diseases, can be better accounted for from the influence of septic acid, striking out a colour as it acts upon the skin, or the deposition of putrid blood, than from the presence of the bile; and the considerable quantity of it secreted in some of the cases of poisoning, called fever, shows, not that it is the cause of the disease, but that a copious flow of it has prevented, in the intestines, the fatal consequences of much *septic venom*, produced there. The greenness of the bile, in such cases, is proof of its mixture with an acid; and, if further evidence is wanted, of its salutary and preserving power, examine the dissections of bodies dead of the *yellow fever*, &c. and it will appear, that, as far above and below the orifice of the ductus communis choledochus, as the biliary fluid extends, so far the duodenum and continuous parts of the intestines are

free from inflammation and its consequences. Now, if by any means the digestive powers are deranged, and the gastric liquor is not duly supplied, and if the liver ceases to perform its office, and the bile is not thrown into the intestines, in quantity sufficient to retard putrefaction of the alimentary substances, and to prevent the formation of septic acid, the aid of medicine, and artificial preparations, must be resorted to. For this purpose, and with this intention, the most of the neutral salts have been prescribed, as the proper remedies, and found salutary and useful; together with many bitter vegetable preparations, oils, &c. The salts, considered as the most effectual cleansers of the alimentary canal, of any septic and feculent matters, are the carbonate of pot-ash, (salt of worm-wood) acetite of pot-ash, (regenerated tartar) sulphite of pot-ash, (vitriolated tartar) tartrite of pot-ash, (soluble tartar) tartrite of soda, (Rochelle salt) sulphate of soda, (Glauber's salt.) These salts are decomposed by the septic acid, which coming in contact with them, the alkaline bases will part with the acids, with which they are combined, and unite with the septic, according to the laws of attraction, and form with them septites. By this means, the cause of the disease will be removed, and the patient, if not too much worn down by disease, recovers. The muriate of soda (common sea-salt) is highly recommended in dysenteric complaints. *Wright* observes, that marine salt, dissolved in any of the vegetable acids, operated as a charm in the dysenteries, in the island of Jamaica, when all the other remedies, which have been celebrated in curing this disease, had failed. Oils have an attraction for, and readily combine with the septic acid. Castor oil was used here (Boston) as a cathartic, in the last epidemic, with evident good effect. The discharges it occasioned were very copious, liquid, green, and, in some cases, almost as dark as ink.

“The neutral salts, with the basis of soda, (observes Dr. Mitchill) are among the most mild, and agreeably efficacious

efficacious articles of the shops. The *tartrite of soda*, (Rochelle salt) is an elegant remedy, and one of which I have employed, with much satisfaction, to keep the intestines free from noxious materials, in our pestilential and other fevers. The *phosphate of soda*, (*soda phosphorata*) is, perhaps, a yet more elegant medicine, readily soluble in water, easy to take, and not difficult to be decomposed in the bowels. The *carbonate of soda*, dissolved in water, and taken into the stomach, at the rate of from four to eight grains in two or three hours, is a most gentle and efficacious remedy in dysenteries, and in cholera infantum. If tenesmus is violent, clysters of soda often afford almost instant relief. Laudanum, if necessary, may be joined in both cases. Indeed, in the three enumerated forms, soda is capable of attracting the septic acid, which, no doubt, is a frequent exciting cause of dysentery."

Dr. Barker, of Portland, is a very respectable testimony, in favour of the use of lime, magnesia, and alkaline salts, in dysenteries and putrid fevers. These diseases were prevalent there in the summer and autumn of 1798. He says—"The mode of treatment, which I pursued, was to cleanse the stomach with *ipecac.* and the intestines with *rhei* and *sal. absynth.* or *sal. cathart.* with *sal. absynth.* Lubricous oils and mucilages were occasionally employed, as also enemas. But the remedies which I depended upon, to counteract the noxious cause, were alkaline salts and earths. My common prescription was, *aq. cal.* ℥j; *sal. absynth.* ʒij. the dose from one to two ounces every hour; and, in some cases, every half hour, or oftener, in an infusion of camomile flowers. Besides this, I used *testa. magnes.* or *creta*, frequently from one to two ounces in twenty-four hours."

Thus are exhibited the most prominent features, and the leading positions of the Mitchillian doctrine of epidemic diseases, and "theory of pestilential fluids;" taken principally from his own writings, and from a
treatise

treatise by Dr. Lent. For further confirmation and proofs, in detail, together with an abundance of novel and important facts, well adapted argument, ingenious reasoning and just conclusion, I must refer to the writings themselves. They will be found well deserving the attention of every inquirer ; of the agricultor, the chemical elaboratist, the natural philosopher, the pathologist, and the medical practitioner.

THE laws and operations of animal life, are many and various ; some of its more interior effects and movements are totally removed beyond the reach of human investigation ; so far, at least, as this investigation is made to rest upon the knowledge gained through the external and bodily senses. If there is not only a difficulty, but an impossibility, in investigating and explaining, to human apprehension, the operations of the animate machinery in an unimpaired state, we are not to wonder, or feel disappointment, if many of the phenomena of disease should not admit of clear elucidation. That pathology, or theory of disease, which will explain the *most* of its symptoms, should be considered as the best ; and that the truest physiology, which accounts for the *most* of the operations and functions of organic life. It is perfectly erroneous to say, that vitality is *derived* from *any* of the elements of nature, taken in or applied to the system. This is so far from true, that, instead of their *imparting* any real vitality, something is always *super-added* to the materials, taken into the system, whether in a gaseous elementary form, or otherwise, before they can become a part of it, or are assimilated ; and any thing or substance, that will not yield to the digestive powers of the system, or, that cannot be changed by them, from the nature, form and qualities it possessed before it entered the system, is deleterious and destructive of its life, in that it does not yield to its

its operations ; which is the case with every thing that has not parted with the living principle ; because life cannot operate upon life without mutual injury. This shows, that there is something in animate nature, superior to any thing in external or material nature. It is true, that animal life is *supported* by the things taken in or applied to the body ; but this, in no way, proves that it is derived *from*, and is produced *by* them : on the contrary, were not animal life sourced in a higher principle than any of the material elements, there could be no such thing as *natural death* ; because, constantly surrounding the body, they are always ready to cherish and support the life they have imparted ; and this life the body must always continue to receive, if originally received in consequence of their operation upon it. When material substances are applied to the living or sensitive principle, such as are congenial to it, and are capable of co-operation with it, are selected, become adherent to, and recipient of, animal and spiritual life and form ; and thus are possessed of a nature superior to that in their elementary state ; thus sublimate and spiritualized, they are fitted to receive, embody, and organize our very thoughts, perceptions and affections ; and thus they are made the substrata and externals of the spiritual body, for future and eternal existence. What is not capable of becoming thus substantiate and spiritualized, or of receiving, retaining, and perpetuating the life or spiritual nature, is ejected and thrown off. This process is continued until the soul is completely embodied and enveloped in such of the natural elements as are, from the spiritual nature, rendered imperishable ; then it is that the natural body begins to decay ; that is, as soon as the spiritual form is complete and the stature full ; old age comes on, and, at length the body dies ; because of no further use, and is only a cumbrous investiture, and real impediment.—The natural powers are the strongest, most operative, and the irritability more diffused, in infancy,

cy, childhood, and up to manhood ; then gradually lessening, in proportion to the increasing exertion and strength of intellectual agency. It is not pretended, that what is here asserted is from any real or positive knowledge of the fact ; it never can be known from any natural experience, or developement from natural proof, however elevated the point of intellection and intuition may be. But *effects* from an application and operation of the natural elements upon animated bodies, *may* and *can* be known ; and these are the proper subjects for investigation. They will always be found sufficiently numerous to employ the most industrious, persevering, active and penetrating minds.

The criterion of just estimation, hinted at in the above remarks, viz. that that is the best pathology which explains the most of the phenomena of diseases and their causes, does not make against the Mitchillian doctrine ; but, on the contrary, inclines us to espouse it as the most rational and just : yet it is not without its difficulties.

Some physicians are in the opinion, that merely a defect or abstraction of oxygene will give rise to putrid diseases ; and the opinion is not destitute of plausibility, nor seemingly, unsupported by fact.

The same concurrence of circumstances necessary to the production of the septic acid, will occasion a diminution of oxygene ; so far then the reasoning is equally applicable in both cases. The phenomena of disease, and the effects in either case upon the human constitution, ought to determine which hypothesis has most of probability, and which is in closest agreement with real fact.

The healthy temperature of the body, the preservation of animal heat, all the various secretions and excretions ; in short, the whole process of animalization depends upon the action and functions of the whole series of vessels and organs ; and their action certainly depends upon a regular supply of vital air or oxygene. This is asserted upon the authority of legitimate

imate experiment and well attested fact. The important use of this ingredient in the administration of the animal economy has caused it to be considered as the pabulum vitæ of all animal nature. The extreme vessels, in the nourishment and preservation of the system, are continually employed in forming animal oxyds of different kinds, as the fat and jellies of the membranous and white parts; in the various depositions of muscle, bone, tendon, &c. for these are all continually absorbed, thrown off in the various excretions, and incessantly renewed. They are continually employed in filling up all the cavities and interstices, &c. But when the body is attacked by a malignant disorder, appearances are then much changed, and all these various operations either immediately cease, or are totally reversed. Instead of the *formation* of animal oxyds, solids, &c. there is a very manifest *decomposition* and dissolution of them: witness the great emaciation of the body, the great secretion and flow of bile in many instances, the astonishing accumulation of fecal and putrid matters in the alimentary canal; insomuch that almost a constant cathartic evacuation is necessary, during the progress of the disease, and even in a state of convalescence. In fact, fibre and fluid, animal fat and gall, feces and urine, all the secretions and excretions are blended in one common and heterogeneous mass; poured into and lodged in the alimentary canal. Now if this condition of the body is a proof of the presence of septic acid, it as strongly marks a defect of oxygene.

But now examine the blood. The direct and manifest effects of vital air upon the blood, as proved by manifold and well attested experiments, are, 1. Its oxygenation, by which it is globulated, and these globules rendered firm, compact, solid, and distinct; and the whole mass coagulable. 2. It *reddens* the blood, or gives to it a bright vermilion tinge, and when it is in this state, then it is, that that principle is supplied to the system, which supports the life and motion

motion of its whole machinery. Now these are not the appearances in diseases. The *dark* and *livid* colour of the blood, when the disease has advanced to the second or third day, and is violent; its frequent incoagulable state; the petechiæ or *purple* spots; the black and offensive discharges by stool and vomit, are proof direct, of defect of oxygene, a consequent prevalence of septon, and an incipient progressive putrefaction: that is, if we give any credit to pneumatic chemistry, and the physiological deductions from principles long since established.

“At the close of the second stage,” says Moseley, “of the disease, and at the time the third stage commences, which decides the fate of the patient, he becomes tranquil and composed, free from distress or anxiety, insomuch that the disease seems to be at an end; but the delusion soon vanishes, a fatal storm soon succeeds the calm, which overwhelms the patient, and completes the catastrophe; a *mortification* comes on, the fluids are *dissolved*, and profuse discharges of *black* blood ensue.”

The face is livid in apoplexies, in strangulations, in fits of coughing, &c. because the process of respiration being suspended, the access of vital air is prevented. The countenance, in a fit of malignant fever, is livid, and not dissimilar in appearance to that of an apoplexy or fit of hysterics.

But is not a defect, abstraction, or want of oxygene an *effect* of which the formation of the septic acid, either in the system or out of it, is the cause? For although septon and oxygene, in their separate state, have a very weak, if any attraction for each other; yet when brought into chemical union, then their attachment becomes very strong, and the combination rapid and intimate, until arrived at the point of saturation. Admit now the fact, that septic acid is sometimes formed in the alimentary canal, and that these are the circumstances attending its formation, if there should not be present at the time of the formation
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of the septic acid, a quantity of oxygene in a gaseous and disengaged state, sufficient to carry the combination to the point of saturation, it may even be drawn from the blood and animal fibre, thus occasioning the livid appearance of the body and blood, always more or less the distinguishing marks of a putrid fever. But if this diminution of oxygene, in and out of the system, results from the formation of the septic acid, it must be simultaneous with this formation of the acid, and proximate of any effect from the acid upon the system. This brings us to the most insuperable difficulty to be met with in the Mitchillian theory. If the irritability of the system is kept up, by a regular and incessant supply of oxygene, and if this supply is withheld or taken from the system, synchronous with the formation of the septic acid, the *irritability* must cease or be suspended as an *immediate* consequence, and previous to any other effect of the acid upon the system : how then can it produce its effects by its stimulating qualities ? Besides, it is not ascertained, whether the withholding or abstracting that principle or ingredient which supports the irritability of the system, will not be as fatal to it, occasion as much commotion and anguish, and produce as great a malignancy of disease, as an *over* supply of the same ingredient, or as an excessive stimulation, from whatever cause, producing indirect debility.

Frequently it happens, that chills or rigours precede the first attack of fever, and that at this time there is a torpor and almost total inaction of all the vessels throughout the system ; after this, and frequently through the progress of the disease, alternations of heat and chills take place. But if the fever were excited and continued by excessive stimulation of the septic acid, this stimulation must be kept up and increased uniformly, (during the presence of the acid) from the first morbid impression, until followed by indirect debility.

The blood and fibre of infants and youth are more oxygenated than that of adults. Infants and youth
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are peculiarly subject to the local form of epidemic disease, called dysentery ; with adults, the disease assumes the more *general* form of fever. The inflammatory stage of fever is much longer with the middle aged, than with those that are past the meridian of life. The irritability of the system diminishes proportionably with the advancement of age ; and the irritability varies with the degree of oxygenation, which depends upon the various proportions of vital air, or oxygene, taken into the system. Females and pregnant women are less liable to be affected by epidemic diseases, than males of the same age. The female system is constitutionally subject to occasional variations in the proportions of oxygene in the blood, causing the mænorrhagic discharges ; and this may be a reason, that they are not so liable to be diseased by atmospheric vicissitude, from a want of the same principle or oxygene.

We have thus stated and discussed what appeared to be difficulties in the Mitchillian theory : as well as something favouring the idea, that putrid diseases are occasioned by a want of the acidifying and consolidating principle. Perhaps it would not become me to express any positive opinion in the case ; I therefore suspend my judgment. Facts, experiments, and the testimony of medical authors are appealed to and adduced, by the advocates of these two opinions. That the disease is caused in one or both of these ways, according to predisponent circumstances, there seems every reason to conclude. Predisposing causes, perhaps, have as much to do in deciding the characteristics and real nature of a disease, as the exciting causes themselves : indeed it is difficult to determine or show the difference, in many instances, between them. Diseases, therefore, may be variant proportionably with their predisposing causes. Dr. Mitchill's investigations are novel and interesting ; his arguments copious, and his deductions, so far as facts can be had and will extend, are just. The abilities, which have
done

done so much, can still do more ; and although some obscurities and difficulties still remain, yet we do not despair that in the end they will be obviated, by fair explanation, and a progressive developement of truth.

We shall here introduce a page or two from Vol. II. *Medicina Nautica*, upon which we shall offer some remarks, which will close the discussion of the subject of pestilential fluids.

“ It is somewhat singular, that among all the variety of articles, that has attracted the attention, and excited the ingenuity of physicians, none of them have ever recommended a process for supplying *factitious oxygene*. But it is easily to be perceived, that their wits have been directed, not to the support of the vital flame, by chemical agents of health ; but solely to the destruction of the matter of contagion, by morbid vapours. (Page 53.)

“ The atmosphere of all warm climates probably possesses a larger proportion of oxygene, than that of our more northerly latitudes ; and there may be some peculiarity of constitution, in unseasoned Europeans, that disposes their blood to receive a greater quantity of this stimulus, and which may favour the disease in question. The seasoned European, the native white inhabitant, and all the people of colour, to the deepest black, who have resided in the (West India) Islands, are observed to be secure against the yellow fever : or, if they become affected, it is from causes which are common to them with the new-comers from the northerly regions. The fallow looks and complexion of these people certainly show that their blood is not so florid, and consequently less oxygenated, than those who are subject to this endemic : and this fact clearly points out and confirms what has been most successful in the prevention. This also strongly elucidates the theory of Dr. Mitchill, whose prophylactic means entirely correspond with the most approved experience on the subject. His doctrine does not superse-

perfede what has been thought the best practice, and while it rather confirms it, has added other assistants that were before employed with doubt and hesitation, because there was no principle established to direct their application.

“ Particular spots of soil, and especially swampy districts of country, give out these pestiferous exhalations, which so singularly affect the human body; and as we recede from the places where they are evolved, we in proportion avoid the poison. In other words, they are too much diluted to be hurtful; or they excite diseases neither so acute nor fatal. (Page 101.)

“ We have been called upon to give our opinion, in what manner contagion affects the human body: Is it to be considered as a stimulant, exhausting the sensorial powers, and producing indirect debility? This subject has been hastily disposed of elsewhere: we have still many doubts; but our reflections are not sufficiently matured to decide. The matter of contagion, whatever it may be; (it may be nitrous gas, or any other gas) certain it is, that it affects the human body by first impregnating the atmosphere. All these gasses, we readily admit, may be called stimulants, if taken into the stomach, or applied to an excoriated surface; but as diffused in the medium which animals breathe, they render it less fit for respiration. The elective attraction of the lungs, giving out and receiving noxious and salutary principles, by expiration and inspiration, is destroyed by the presence of the contagious miasmita; and the first symptoms of infection would appear to be the imperfect expansion of the lungs, *abstraction* of *heat* and *oxygen*, with a corresponding sensation throughout the whole frame. We see no reason, however, that excludes the supposition of the hurtful quality being *first* applied to the nerves, spread on the delicate membranes of the bronchia, and *from them* communicated to the system. Is it inconsistent with the wise defence which nature has

has given to other organs, to say that the nerves expanded on the pulmonary vesicles, are endowed with a perceptive disposition, that enables them to distinguish the hurtful qualities of the air, abstracted from all chemical combination which respiration may effect on the vital fluid? Is it gross to say that they feel? that they possess an animal appetency for the express purpose? Their sense we know to be most exquisite, from the least irritation, throwing the trachea and bronchia into convulsive action. And these nerves must be admirably suited for that intention; as the blood, warmed and stimulated by every fresh accession of oxygene, must be constantly bestowing excitement. Surely it is reasonable to admit, from analogy, that the lungs, so wonderfully constructed, may distinguish a poisonous quality in the air, through the medium of nerves, as well as the optic nerves should discern light. Sulphurous and nitrous gas excite coughing: an excoriated or wounded part feels an increase of pain, when held in a vessel containing oxygene gas: with equal propriety, therefore, it may be said, that the pulmonary nerves become diseased by the application of contagious matter, and that the lungs, in consequence, cease to perform aright their chemical functions. I am led into these reflections, by being persuaded, that this subject has been considered too much in a chemical view; and the presence of a vital principle operating in the system, made but of secondary consequence in this sublime operation of nature. Whether this opinion will be admitted or not, our doubts are not yet removed, that *the effect of contagion is the abstraction of stimulus from the body, and the succeeding typhus a disease of direct debility.*

“We can hardly suppose that contagious matter acts as a stimulant producing indirect debility, when we see its action so manifestly assisted by predisposition, and that depending generally on a debilitated state of the body. Its previous stimulant power has never been marked; and the very slow progress of the early

ly symptoms sometimes is a strong argument against its existence. But if it induces fever, by directly affecting the organs of respiration, by deficient stimulus to *their nerves*, or by imparting *less oxygene* to the blood, the whole operation may be accounted for, without admitting its stimulant power. The diseased condition of the stomach, we think, is always a secondary attendant on the febrile state: the contrary opinion arose chiefly from the notion, that the poison was received by the stomach, afterwards taken into the circulation, and there became the cause of the fever. This could never be the case in those instances where contagion in a moment, quicker than thought, induces wild delirium, and sometimes instant death. As acting immediately on the organs of respiration, the fact is explained; and also leaves us strongly impressed, that the nervous system is primarily affected."

If there be much of truth and medical orthodoxy in the above paragraphs, there is at the same time much contradictory assertion; and the facts stated, (if they are facts) seem quite in open rupture with each other. In one place, the production and artificial supply of oxygene is recommended as a corrective of febrile miasmita, the generation of which, it is said, is favoured by air, which respiration in crowded places has rendered impure. And it is further thought, that contagious matter induces fever, by imparting *less oxygene* to the blood, than is usual in a state of health; thereby depriving the nerves of the natural and wonted stimuli. But then in another place, and contrary of this, it is stated, that, probably, the atmosphere of all warm climates possesses a larger proportion of oxygene, than the more northerly latitudes; and that, from some peculiarity of constitution, the blood of Europeans is more disposed to receive a greater quantity of this stimulus, than the blood of the natives; and, that this is the reason the former are more subject to the disease of yellow fever; but that, if the disease do attack the latter, it is from a *cause, common* to

to the *former*!—Now, that the blood of unseasoned Europeans, who have, as stated in the extracts, been accustomed to breathe in an atmosphere of an *under* proportion of oxygene, should nevertheless possess *more* oxygene than the blood of the natives, who have always breathed an atmosphere of an *over* proportion of oxygene, is to me unaccountable. Besides, why is it advised, in order to avoid pestiferous exhalations, which so peculiarly affect the human constitution, to recede from swampy districts, whence they proceed? Is it because there is, in these places, less or more of oxygene than in elevated situations? I will not attempt to solve the difficulty, until I am more fully persuaded of the facts. Eudiometrical experiments, especially those made by Dr. Clark, if accurately done, establish directly the opposite opinion—that there is *less* of oxygene in these climates. Both of these statements, I conceive, may be thus far true; that, in the warmer latitudes, there is more oxygene elaborated and drawn from vegetable surfaces, and other ways, during the *day*, than in colder latitudes; but that, in the *night*, it is diminished in exact proportion to its greater abundance in the day time. If this be fact, and if it be further true, as is asserted by the most respectable physicians in the West Indies, that the disease almost invariably commences in the night, it is most powerful and decisive in favour of the opinion, that the fever is a disease of direct debility, and occasioned by a deficient supply of oxygene.

T R E A T M E N T.

THE method of cure generally advised and pursued by the physicians here, was concisely this:—On the commencement of the disease, or in the first paroxysm, when there is great heat and convulsed motion of the heart and vessels, evacuate thoroughly and universally, by mercurial cathartics, by diaphoresis,

refis, and by blood-letting ; all these, with poultices, fomentations, pediluvium, bathing, (cold and warm) blistering enemata, &c. in such extent, variety, and continuance of application, as circumstances require. After one or two effectual cathartic evacuations, give mercurial pills of one, two or three grains, every one, two or three hours, as symptoms shall indicate. Move the bowels with something cathartic every, or every other day. DRINKS—subacid, diluent, emolient. Continue thus, till arterial commotion and heat subside ; secretions and excretions are in some measure restored, and the signs of returning health appear. Then use restoratives, viz. wine, bark, &c. FOOD—light and easy to the stomach, but generous and gently stimulating ; in small quantities, and often.

CATHARTIC EVACUANTS—To cleanse the first passages as thoroughly and speedily as possible, which certainly is the leading indication in the cure, calomel is considered as the safest, most certain and effectual. For this purpose, it is sometimes given, without mixture with any other cathartic, from 12, 15 to 20 grains, in powder or bolus ; but more frequently it is used with jalap ; from 10 to 15 gr. cal.—from 20 to 25 jal. Some physicians give the preference to senna, manna, cream of Tartar, salts, oils, &c. for cleansing the bowels. After administering some one or more of these, once or twice, with thorough effect ; then the small pills of calomel are given, as we have already stated. “I believe,” says Dr. Warren,* (and this was the universal opinion of physicians in Boston) “that the most efficacious remedy, and the only one to be relied on (in the cure of the fever) is mercury. It is certain, that, as far as my observation has extended, under no other method of treatment did so many recover.” “The calomel was often continued through the whole course of the fever ; and ptyalism was usually brought on within three or four days : though sometimes upwards of 200 grains were given, at the rate of a grain every hour, without any specific

* Tytler, page 503.

specific effect on the salivary glands. In proportion as the forenefs of the mouth advanced, the fymptoms univerfally gave way ; and in every patient, two only excepted, this effect of the remedy was a fure pledge of recovery."

BLEEDING—When there is a full, hard pulfe, dry fkin, great heat, and violent pains in the head, ftomach and bowels, is certainly an excellent remedy, if not a *fina qua non* of a cure. With the plethoric and middle aged, it is fometimes neceffary to repeat it feveral times. The quantity taken muft be in proportion to the ftrength of the patient, and the urgency of fymptoms. In this town, 1798, it was unusual to bleed beyond the third time ; oftener twice.

After bleeding, and the evacuation of the bowels of their putrid or putrefying contents, and with the intention of allaying the exceffive vafcular diftrefs, and preventing the putrefaction and diffolution of the blood and fluids ; the more urgent and painful fymptoms, which mark the feveral ftages of the difeafe, claim attention and remedy.

BLISTERING—The firft ftage of the difeafe was generally marked with fevere and pungent pains in the head, and down the back and loins ; alfo a heat, and burning fenfation at the præcordia, together with nauſea and vomiting, or violent retchings to vomit. Epifpaftics upon the back, neck, or under the occiput, and over the ftomach, are found to be ferviceable in allaying thefe fymptoms ; fometimes the relief and benefit is very evident. Fomentations were fometimes ufed as a fubftitute for blistering, to relieve the diftreffing fymptoms of gaſtritis. Mint tea, with a few drops of liquid laudanum, is good to allay convulfions or nauſea of the ftomach. Dr. M'Lane ufed with good effect, a folution of white vitriol, in peppermint water, with the addition of a little laudanum, or paragoric elixir. Two ſcruples of the vitriolic were diffolved in fix ounces of water, with thirty drops of laudanum. He gave a table ſpoonful every half hour,

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till the symptoms disappeared. Blisters are applied to the temples, neck and back, thighs and arms, to rouse the system from the torpor, low delirium, and extreme debility, which mark the second stage of the disease.

PEDILUVIUM—This, with poultices, &c. is frequently used to moderate the violent determination of the blood to the head, and to assist in opening the pores of the skin, and in bringing on perspiration. But all this is perhaps better and more expeditiously done, by the

WARM BATH—Dr. M'Lane, after bleeding his patient, and evacuating the bowels by physic, or an injection, ordered him into the *warm* bath, and while sitting there, half elevated out of the tub, three buckets of *cold* water were dashed over him. He was then taken out, and, after being well rubbed with a rough dry cloth, was put to bed, and well covered. The room was chosen airy and open, and the bed placed in such a manner, that no direct draught of air played upon it. Drs. Rush and Griffiths advise, if the disease does not yield to cathartic evacuation and bleeding, to endeavour to bring on a profuse perspiration, by wrapping up the patient in blankets, with five or six hot bricks, wet with vinegar, applied to different parts of his body; giving the patient at the same time repeated draughts of *hot* camomile tea, or sage tea; *hot* lemonade, or weak punch, *hot* liquor, that is agreeable to him to drink.

“The sweating remedy should be used but *four* or *five* hours at a time, and but *once* in the twenty-four hours. If the patient should become faint, during the exercise of this *excellent* remedy, it should be discontinued for a few hours; but renew, (under the circumstances formerly mentioned) if the disease continue.”

COLD BATHING—Is by many physicians considered as a sovereign remedy; especially during what is called the inflammatory stage of the disease, or while
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there is great heat and arterial commotion in the system. The manner of application is, generally, to strip the patient naked, removing from under him such of the bed-clothes as would be injured by wetting them; let his posture be easy; then dash the water upon him, with some force, by standing at a distance from the patient, and from any convenient vessel, till the heat appears to be abated. Another mode of laving the body is by rubbing it with sponges dipped in cold water, or vinegar and water. In this manner the face, hands and arms, feet and legs, should be moistened every hour in the day, during the heat of fever. In this town, during the last epidemic, when the heat of the summer was most excessive, and the disease bearing the inflammatory type, this remedy was used by Drs. Eustis, Hayward, and Whipple, with very evident good effect, producing, in several instances, complete relief and an expeditious cure. Dr. Currie recommends the use of the cold bath under the following precautions, viz.—*When there is no sense of chilliness present; where the heat of the surface is above what is natural; and when there is no general or profuse perspiration.* It is also considered as an excellent internal remedy, in fevers of all descriptions; and it is recommended to be taken in such quantities as the patient shall desire, but under the same restrictions as when externally applied.

ENEMAS—During the extreme irritability of the stomach, the administration of medicine in this way should be entirely suspended; all attempts will prove fruitless, and the difficulty only increased and aggravated by such attempts.* In the mean time, cathartic
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“I had a case of black-vomiting in my own family, on Long-Island, this season (1799.) A young girl, my niece, three days after leaving the city, in the month of September, was found to labour under the usual symptoms of the pestilence. Apprehensive of the threatened state of the stomach, I evacuated the alimentary canal as soon as possible, by cathartics, and ordered the bowels to be kept open by clysters. Toward the close of the second day of the malady, she vomited up dark-coloured matter in the usual manner, and I believed the time of her death was very near. As I had never known any remedies, whether acid, alkaline, or neutral, nor of any other quality, do good in that dangerous condition of the stomach, but had always found every thing taken in of the medicinal

and nutritious injections must be made with frequency, with such topical applications as symptoms shall indicate. The injection may be veal or chicken broth, or water-gruel, if meant to be wholly nutritive ; if for a cathartic effect, a table spoonful or two of Glauber's salts may be dissolved in the gruel, and a little sweet oil and molasses added ; a table spoonful of each.

OPIUM—was frequently combined with calomel, to prevent it from passing off by the bowels, and assist its diffusion in the system, and thereby insure its effects upon the glandular system. When there was no inclination to vomit, and to produce a diaphoretic effect, a grain or two of tart. emet. was added. Opium was also used, when such casual symptoms occurred, as indicate the use of this medicine ; and this was more especially the case during convalescence.

DRINKS—To assist and promote the different evacuations, always proper to be made as the first thing necessary in the cure of fever, large quantities of diluent

dicinal kind to do harm, by increasing the irritation and disposition to vomit, I determined, in this case, to leave the stomach as much to itself as I could. I therefore withheld all medicines, and forbade the administration of food, until the patient should ask for it, and gratified her to the full, by allowing the draughts of cool water she called for. The surface of the body was bathed frequently with cool salt-water and soap-suds alternately ; and an epispastic was applied to the epigastric region. The black-vomiting ceased toward the end of the third day ; and after an abstinence of eight days from all kind of food, she asked for a roasted potatoe. During those eight days, she drank no drink but cool water ; and, what is very remarkable, at the end of that time possessed more strength than she did on the third day from the attack. She recovered, and has been very well ever since. I am quite satisfied, from the ill-success of giving medicine to stop black-vomiting, that the best way is to let the stomach remain as much at rest as possible, and not be tormented and thrown into convulsions by foreign matters taken down. In order to make this mode of management successful, the alimentary canal ought to be cleared effectually, in the early part of the disease ; and the large intestines should be plied with injections. A physician, who stayed in New York the whole of this season, informed me he had, in addition to a total cessation of remedies by the mouth, given injections from time to time with large quantities of laudanum, in some cases as much as half an ounce at a time. While this thebaic tincture acted upon the large intestines, the vomiting stopped, and the stomach was easy. If, when its effect was past, the vomiting returned, the injection with the laudanum was repeated, and continued as long as the symptoms required. The event of this mode of management, he says, was the recovery of a greater proportion of the sick, than by any other practice ;—and I think it very likely to be true."

(MS. Letter from Dr. Mitchill.

luent and subacid drinks are given. Toast and water, tamarind water, lemonade, currant jelly dissolved in water, apple-water, barley-water, balm tea, marsh-mallows tea, &c. &c. In the latter stage of the disorder, the drinks may be porter and water, claret and water, milk and water, camomile tea. Clutton's febrifuge spirit, thirty drops in cold water, given between the doses of calomel, is recommended by Dr. Rand, as excellent, to cool the body and allay the thirst: and, besides being grateful, it composed the jactitation, and was often sedative at night. A tea spoonful of vitriolic æther, in half a wine glass of cold water, is highly commended by Dr. Chesholm, as an excellent febrifuge medicine. Given as above, he found it extremely grateful to the patient; and that thirst, nausea, and oppression often fled before it.

FOOD—None, till after the crisis. Then begin with the lightest and mildest kind, and such as is easiest of digestion, and such as can be taken in a liquid form. Weak tea and coffee, milk or water porridge, milk in water, roasted or baked fruits, chocolate, sago, weak chicken or veal broth; from these gradually advance in the use of the more substantial foods, until the powers of digestion are fully and permanently restored.

APARTMENTS—For the sick should be the highest in the house, without coming immediately under the roof. The more elevated the room, the purer the air will be found. In the beginning of the fever, when the skin is hot, and the pulse tense, cool and pure air should be freely admitted, and constantly agitated and circulated through the room, and over the bed of the patient. The sheet or blanket, which covers the patient, should be occasionally taken by the corners, and quickly raised up and down, which will not only answer the purpose of fanning and cooling the patient, but also supply fresh air to the body, which otherwise becomes mephitic and deleterious.

The linen of the bed, and on the body, must be shifted as soon as any thing unclean is attached to them;

them; the evacuations from the body must be cautiously and expeditiously removed; and all possible care taken to keep the room and bed sweet and clean. Sprinkle frequently with vinegar; wash with soap-suds, or with alkaline lie. In cases of great weakness, the patient should not be permitted to rise from his bed, when under the operation of physic, nor upon any other occasion.

The utility of mercurial remedies, in epidemic diseases of all descriptions and degrees of malignity, seems now almost universally acknowledged by the medical faculty; it is even considered as a *specific* in the small-pox, measles, dysentery, scarlatina, influenza, &c. &c. In a medical publication, of September, 1798, and while the malignant fever was making its ravages among us, I observed respecting the use of this remedy as follows:

In this town (Boston) gentlemen of the faculty confide much in the use of mercury, as a remedy in the prevalent disease; and Drs. Rush and Griffiths of Philadelphia say, if the mouth and gums can be affected, and a salivation raised, the cure is almost certain. Alas, how frequently have they and their brethren failed in this attempt! Southern papers of late are little else than mementos of disease and mortality, and the city of Philadelphia, the metropolis of the Union, one vast tomb of putrefaction and death! But I mean not to speak against the use of mercury, as a remedy. I believe it a very good one, rightly used. I have seen very salutary effects from it; but that it may be salutary in its effects, it should not be confined in its operations to the *primæ viæ*, and internal organs and vessels, but it should have determination to the skin also, and to the glandular parts of the system; and thus become a universal evacuant. Might it not, therefore, be more frequently combined with diaphoretic and anodyne medicine?

But how does mercury operate, in producing this universal stimulation and evacuation? Is it not by imparting

parting *oxygene* to the system? If so, it is the very treatment and indication of cure recommended and pointed out by Dr. Mitchill, of New York; viz. to subduct *septon*, and introduce *oxygene*; and is confirmation strong, that septic compounds are the cause of the disease. I am strengthened in this opinion, from observing the countenances of those under mercurial treatment, in venereal and gonorrheal complaints, which are florid and transparent; more especially when the cure is nearly completed. Also—In florid consumptions, mercury, by all, is allowed to be prejudicial; I believe, because the system is already *super-oxygenated*.

It is a fact well known, that mercury, in its metallic state, has no effect upon the human body. Experiments also prove, that the effects of mercurial ointment are wholly owing to the small quantity of mercury that has been oxydated in the course of a long trituration.

On the other hand, it is well known, that in persons who have rubbed themselves with mercurial ointment, or who have taken the oxyd of mercury internally, the mercury, after having produced its usual effects upon the system, has passed through the pores of the skin in a *metallic* form, and has amalgamated itself with watches, gold in the pocket, &c.

It has been asked—"If mercury is thus beneficial by imparting *oxygene* to the system, whether *oxygene* without the mercury will not effect the cure?" Future trial and experience will best decide the question. It was with this intention that Dr. Mitchill, as he has told us, prescribed the various fruits abounding with *oxygene*, mentioned in his letter above. But if the *oxygene* is meant to be applied to the lungs in respiration, the attempt, I think, will be unsuccessful, and fail of cure; not because of any fault of the remedy, but because this organ, being early affected by the disease, its functions are so materially impaired as not to admit of being restored by any efficacy

efficacy of the medicine. The blood which is found to gorge and distend the lungs, increases their density, shuts up the absorbent mouths of the vessels, renders them impervious, and inaccessible to the oxygene air applied, so that it cannot reach and purify the volume of blood as it passes through them; or, if at all, the quantity must be quite small, and inadequate to the effect intended. The benefit of the access of fresh and pure air, in cases of high fever, is universally admitted. Air is more or less pure and exhilarating, in proportion as it is more or less oxygenated.

But whatever may be the efficient ingredient in mercurial preparations, certain it is, there is no medicine more safe and infallible, in promoting diaphoresis, or universal perspiration: it seems to have a direct, if not a specific effect upon the glandular and lymphatic systems, exciting them to motion and action, by which means the morbid matter is eliminated and discharged from the system, either by defluxion into the alimentary canal, or from the cuticular and external emunctories; and also the secretions and excretions restored to some degree of healthful regularity, without which life cannot long be preserved.

PREVENTATIVE MEANS.

MANY plans have, at different times, been proposed, for clarifying and preserving the purity of city atmospheres; but most of them have been either too partial and limited, or ill timed, and so reluctantly executed, as that the expected good effects have not been realized. The exertions hitherto have failed, (this town the last summer is an exception) and no barrier has yet been opposed, sufficient to suppress this death-working disease. It yet boldly stalks among us.

All large cities have ever been, and ever will be, afflicted with pestilential diseases, until privies, graveyards,

yards, and nuisances are removed ; sewers constructed, and aqueducts completed—and until every attention and care is paid to the preservation of cleanliness, in doors and out ; as also to convenience and good accommodation. This can only be done by wise, appropriate and strictly executed laws, meeting the willing and prompt compliance of the inhabitants.

Frequently agitating the atmosphere, sprinkling and watering the streets and houses, will be found very salutary. It will serve to absorb and neutralize those acid particles, that may have collected in the atmosphere, in consequence of great heat, and by the aid of putrefaction. It will be found greatly beneficial, to strew docks, stagnant waters, privies, &c. frequently with caustic lime. This was tried in Boston, 1788, with manifest good effect. But all this will be to no purpose, without a strict attention to diet and the habits of body. The matter of disease may be generated *in*, as well as *out* of the body. A light, easy, vegetable diet is the most proper : meat, highly injurious, because it corrupts the fluids, and renders them liable to putrefaction from any slight interruption of the animal functions. Ardent spirits—pernicious at all times. All exercise of body and mind should be temperate, orderly, and methodical. Our delights and enjoyments should be prescribed by reason, and regulated by prudence ; not by the extent of appetite, passion, or desire. They should enliven and invigorate, not depress and exhaust.

THE PREDISPOSING CAUSES—Generally enumerated, are, fatigue, a long walk, standing in the sun or in a current of air, intemperance in eating or drinking, costiveness, violent passions, or sudden emotions of the mind, too thin dress, light bed-clothes, and, above all, the night air. These, as well as the causes or cause directly exciting the disease, are to be avoided or prevented.

Now more particularly.

Reasons and facts the most obvious, lead us to ascribe the disease of the several capitals of the Union

(certainly of Boston) to *local circumstances, dietetic vices, and disorderly habits*. The circumstances of situation, and the casual causes, we have already detailed. They are such as pretty clearly shew the disease to be of domestic origin. I do not deny that the disease may be generated in ships as well as in houses, brought to our wharves, and (if the season and other circumstances be favourable) circulated through the town: but at present there seems to be no reason to conclude, that the late sickness was thus originated.

REGIMEN, PERSONAL MANAGEMENT, &c.—The mode of living considered as most injurious and destructive of health, by inducing that kind of temperament, which predisposes to infection and disease, consists in the excessive use of strong or spirituous liquors, and of gross animal food: The powers of life, by this mode of living, are strained to the highest pitch; and, when exposed to disease, there is no new or unemployed force to repel the enemy. The strength collapses; debility or exhaustion, with all its sad consequences, ensues. It is to this circumstance, mainly, that we are to ascribe the unusual mortality, and the general difficulty, almost impossibility, of cure in the late fever.

Perhaps no people in the world make so free a use of *flesh* food as the Americans, especially in populous towns; by which means the serum of the blood is loaded with crude and heterogeneous matters, the cruor increased to over proportion, the lymph vitiated and changed from its glutinous, cohesive, plastic nature; and thus the whole mass becomes acrid, corrosive, and of putrid tendency; and thus the fluids, being mixed and confounded, are rendered unfit for receiving the proper degrees of animation; the process of animalization is impeded, and disease ensues.

Dr. McLean, in a treatise on the fever of St. Domingo, observes, that if the disease came on after a debauch in wine, &c. there was always the greatest danger; and he hardly ever knew one instance of a
favourable

favourable termination, when the fever began under these circumstances. And it is further remarked by physicians of *New-York* and *Philadelphia*, that Frenchmen, who had not long resided there, almost universally escaped the disease ; which I think cannot be better accounted for, than by ascribing it to a difference of temperament, from their regular and abstemious mode of living. They are especially spare in the use of flesh food.

While the disease was in its commencement in this town, I found, on inquiry, that the attack was in many instances preceded by some species of intemperance ; most frequently, in eating or drinking. One had eaten freely of pine-apples on going into bed. Another had feasted much, and copiously partook of wine, and at last yielded *prostrate* obedience to the *juicy sovereign* ; but was soon roused from this humble attitude, by the pangs of an internal fire, which it was difficult to extinguish but with life. One, after a hard day's labour, ate a full supper of fried meat, went to bed, but awoke from sleep in torments of a *cholera morbus*. I could enlarge the enumeration, and particularize instances ; but this is not necessary ; enough, however, to evince, that our only safety is within the precincts of temperance, moderation, and reason : All beyond is ruin and disease. Death is there, and the guests of the deepest misery.

A writer of nice observation, of acute and extensive researches, asserts, that the wonderful and efficacious powers of *regimen* will never be attended to until the human mind acquires a great capacity of thought and reflection, which makes a man his own physician, carrying a delicate attention to the effects of food, clothing, air, sleep, &c. &c. Man will never obtain either moral or physical health, until he *knows himself*.

CLEANLINESS.—After a proper diet, nothing more contributes to health and its preservation, than cleanliness of person and apparel. A want of a due attention to this particular of domestic economy, is the occasion

casion of a variety of diseases in young and old, viz. the itch, scald-head, leprosy, scurvy, rheumatism; and if it does not give origin to pestilential fevers, plague, &c. it certainly helps to extend, circulate, and continue them, when once they have appeared.

Physicians, who have written on the subject of fevers and epidemical diseases, observe, that they, almost without exception, commence with the poorer class of citizens, who are too frequently as negligent of cleanliness and neatness of person, as they are regardless of the quantity and quality of the food and drink they consume.

It was not unfrequent, on the first visitation of a patient of the above description, to find him enveloped in a rotten feather-bed, little less pleasant to the *olfactories*, than a lump of putrefaction; or, rolled up in blankets, quilts and rags, which would not have been more disagreeable, if they had been used in the lowest offices of a foundling hospital.

Frequent bathings, in the warmer seasons, when the blood is in a calm state of circulation, is very salutary, and greatly contributes to the continuance of health. When the body has been a considerable time in full perspiration, the volatile particles of the perspired matter escape, and leave an incruusted matter upon the surface of the body, which often frets and corrodes the extremities of the exhalent vessels, and thus lay the foundation for disease. This is remedied by frequently laving the body in water of moderate temperature.* It also agreeably refreshes and invigorates the system, and preserves and enlivens the actions of the lymphatic vessels, upon which the purity of the blood,

* Mr. Volney, in his *Travels in Egypt and Syria*, Chap. xvii. informs, that "at Cairo, it is observed the water-carriers, continually wet with the fresh water they carry in skins upon their backs, are never subject to the plague." This fact, says Mr. Webster, if accurately stated, is worth an empire.

The most safe, easy, pleasant and beneficial mode of using water, is, to bathe or wash the body in a private apartment at home. This may be done several ways—either in a large vessel, immersing the whole body at once; or, what is less troublesome, with a single pail or bowl of water, in a bed-chamber. The washing may be done with the hand, or a sponge, in a few moments, as the person rises in the morning, or retires at night. (*Webster's Treatise*.)

blood, and the perfect health of the body, very much depend. This practice should become frequent, as it was among the ancients, and is now with the inhabitants of the southern and middle latitudes.

To me it seems most probable, that the proximate cause of all fevers affecting the system, generally, is deranged motion, or a total want of action in the lymphatic system, consisting of exhalents and absorbents. When these vessels are in healthy motion, all deleterious matters, floating in the common mass of the circulating medium, are eliminated and perspired. But, let this process be checked, and the skin becomes hot and inflamed; the whole body soon feels all the distress of a fever paroxysm.

By the absorbent vessels, the body is preserved in that state of dilution and suppleness, so necessary to organic function and muscular motion: perhaps the body is more diluted by cuticular and pulmonic absorption, than by the various drinks taken in by the stomach; and if a patient were indulged with all the drinks he might crave, in the progress of a violent fever, it might not equal the quantity required in a state of health. The excess of quantity, that is craved and taken in by the stomach, is occasioned by a check upon the usual supply by the absorbents.

Sailors at sea, when in want of fresh water to quench thirst, plunge into the sea; and, remaining a while, their thirst subsides. Whether this is effected by absorption of moisture, in the form of gas, and combined after entering the system; or, whether the particles of *water* are absorbed, I pretend not to decide. It is, however, generally accredited by modern physiologists, that the *skin* is to the *lymphatic* system, what the *lungs* are to the *arterial*; and it is pretty clearly ascertained, that there is a constant decomposition and consequent absorption of *oxygen* from atmospheric air, or water in contact with the skin, by which the irritability is preserved and supported. Now, there is much reason for supposing, that all putrid

trid diseases are in consequence of deficient supply of *oxygene*, or vital air ; which, certainly, is very important in all the functions of the animal economy, if not the prime supporter of all muscular irritability. Hence then the indication of cure in fever of much heat, to lave the body with water of various temperatures, according to circumstances. The superabundant heat, confined within the body by the dry, dense and hardened surface of the skin, enters into and is drawn off by the water and cold thus applied, the skin being rendered lax, pliant and porous ; and thus the heat and paroxysm of fever immediately subside.

Anointing the body with olive oil has lately been much spoken of, as an almost certain remedy in the cure of the plague, and also of the hydrophobia. Oil and animal fat decompose the septic acid. If there has been much exercise and fatigue of body, and if the perspiration has been profuse, after laving with water, it may be very serviceable to rub the skin with a sponge dipped in this oil ; at any rate, it will serve to soften and lubricate the skin, soothe the mouths of the exhalent vessels that have been unduly exercised and fretted by the acrid and saline matter of perspiration. This will be most conveniently done at evening. It will be found proper to have a vest particularly to sleep in after this treatment. It is a good practice to shift the linen every night, and to have a garment *purposely* to sleep in. Never sleep on feathers after the first of May to the beginning of October, inclusively. The clothing should always be varied with the difference of season, constitution and habits, attending particularly to neatness, conveniency and ease. Preserve, as much as possible, an even temperature of body, and be guarded against sudden changes of weather, more particularly the damp airs of the night.

Physicians, in the *West Indies*, recommend very highly wearing waistcoats of India cotton *under* the linen. They are considered as much preferable to flannel,

flannel, because better conductors of heat, less irritating, and therefore more comforting, and equally absorbent of perspiration,

A due attention to diet and regimen will, for the most part, render the use of medicine quite unnecessary: should there be, however, at any time a tension or costiveness in the bowels, some cooling cathartic may be taken to restore them to a healthy state, particularly a solution of cream of Tartar, or Glauber's salt. If the stomach should be found loaded with viscid, phlegmy, or bilious matters, or indigestible fordes, an emetic will be proper.

To prevent and destroy the Matter of Disease in Ships, Jails, Hospitals, private Dwellings, &c.

Whether it be true, that the disease, which has raged with such unconquerable violence in most of the cities and capital towns of the United States for eight or nine years past, be occasioned by the generation and diffusion of septic acids; or, whether it arises from a sparsity of oxygene in the atmosphere, and an abstraction of it from the body by excessive heat, &c. is not material to our present purpose to be decided: in either case, the remedial or preventative means must be the same.*

In

* "When a disease proceeds from an elementary source, men may just as well attempt to save the cats, the wild animals, or the fish of the ocean from the effects of that principle, as their own species, by laws enjoining *quarantine* and *purification* of ships. In nine cases of ten, in which quarantine is enjoined, human efforts are opposed to the great laws of nature, and are therefore *useless*. In all cases, where the air of a country exhibits evidence of a pestilential constitution, in an increase of the number and violence of the symptoms of common diseases; in the production of certain epidemics, as catarrh, anginas, measles, petechial fevers, and the like; in the death of fish, or the unusual diseases of cattle and other animals; in all such cases, the pestilence which invades man will be found to arise from the uncontrollable laws of the elements; and quarantine will be utterly unavailing, to guard cities against its introduction and ravages." (*Webster*, p. 207. Vol. II.)

I am as much convinced of the absurdity of quarantine regulations, for the prevention of diseases, as they have been usually established and executed, as any one can be. But this is not what I aim at, as objectionable, in the above quotation. Mr. Webster has run into conclusions, which it is not safe to admit, and which I think are not strictly just. I allude to the distinction he makes between elementary causes of disease, and local causes, or infection.

The

In ships, therefore, which may be supposed to contain noxious effluvia, whether derived from infected articles, or generated from the collection and putrefaction of such materials as contain septon, (and these always make up a part of the freighting of ships, viz. provisions, meat, &c. of various kinds; trunks of clothes,

The latter, he thinks, are within the reach of police regulations, and the control of human exertion; but that condition of the elements, which gives rise to all epidemic diseases, he asserts is not thus controllable, but depends wholly upon the invariable laws and operations of nature; and therefore, in these cases, he insists that quarantine, and police regulations, are altogether *futile*. I cannot admit that the elements, in their natural state, are ever hostile to the health, convenience, and happiness of man; that is, when his happiness is *rational*, his convenience not *whimsical*, his health not *facilitious* or forced. Whenever the condition of the elements becomes so deranged, as to be productive of epidemic disease, it is proof to me, that the laws of nature have been *partially* interrupted by a false economy, by the perverting faculties, and the misapplication of the physical and intellectual powers of man. All general causes are made up wholly of particular or local causes; and no cause can become general, *prior* to the existence of particular or local causes: remove, therefore, the local and particular causes, and the general or elementary cause, ceases or never will exist. Attention to city cleanliness and naval purification, if it does not put an immediate arrest upon the disease, already become epidemic, may shorten the period of its duration, and completely prevent a return of it. Mr. Webster admits, (if not in the above quotation) that there may be cases of sporadic disease of the same characteristic marks, and equally malignant as those of an epidemic; the *nature* of the cause, then, must be the same in both cases; and the *difference* only in the degree of extent. The only inquiry then, is, What is the nature and qualities of that element or matter, (so far as any thing material is concerned) which gives origin to disease? This ascertained, the means of remedy will be the same, only differently proportioned, according to the locality or universality of the cause. There may be some peculiarity in the situation of our earth, relative to the rest of the planetary system, which may cause the sun to pour its rays in greater profusion, in some years than in others, upon certain portions of the earth's surface, thereby making one year more sickly than another; but this never will happen to so great a degree, as to render disease inevitable, if a due temperament of body and mind is preserved; if the economy is regular, the indulgencies and habits chaste and temperate.

(Vol. II. p. 200.)—"Remove the sick, cleanse the houses and clothes, do whatever human art and labour is competent to effect, all will not avail; cases spring up in every quarter, and the disease takes its course."—Then, die we must; for I contend, that, if to prevent an epidemic disease is thus impossible, there never could be a single instance of recovery from the disease, during the continuance of the pestilential state of the atmosphere. All medical aid would be totally useless, and labour lost; for a disease never can be *cured*, that cannot be *prevented*. I must still be of opinion, that if cities could be rendered more commodious, by a different arrangement of streets and buildings; if the means of purification and cleanliness, both of person and in domestic economy, could be particularly, generally, and universally embraced, and strictly observed, it would interpose an effectual barrier to almost every species of disease. Longevity would be much more frequent, and man, now like the *grass which the wind passeth over, and it is gone*, would then fall, like a shock of corn fully ripe, in all the fragrance of wisdom, and maturity of age; every movement in the journey of life being prompted by desire of good, and marked with usefulness, he would only die to live.

clothes, sometimes rotten with dirt and perspiration ; bedding, often in a similar condition) it will be proper, from the known affinity which subsists between these infectious vapours and calcareous earth (lime) to expose this substance to an atmosphere impregnated with these vapours. White-washing between decks, and such other places where it is practicable ; also, strewing it in the holds of ships, will be the most advantageous methods in which it can be applied. Frequent repetitions will be necessary where the infectious matter is abundant. In instances where these effluvia have, for any length of time, been present in such abundance as to attach to, and insinuate into the timbers of vessels, from whence they may be forced out by excessive heat, and when thus liberated, infect the crews, it will be highly proper to wash, frequently, the timbers thus impregnated, with a solution of the vegetable alkali (pot-ash) in water. This substance has the greatest known affinity with the septic acid ; it will therefore disengage it from its connexion with the wood, neutralize, and render it harmless. A frequent use of alkaline liquors in apartments must tend greatly to cleanse and carry off noxious vapours ; and will also, by being imbibed into the texture of the wood, take up and convey away such of the noxious matter as may still remain. Ventilation must not be neglected ; the contaminated atmosphere will thereby have part of its volume conveyed off, and a quantity of purer air admitted. If any of the articles, designed as provision for the ship's hands, should become in any degree putrid, they must be parted with immediately ; and every attention and pains given to preserve personal cleanliness : *less* of ardent spirits, and *more* of soap and water should be recommended and enjoined for ships' use.

The same means made use of for preventing the origin and spread of diseases in ships, are equally proper to be used in prisons, hospitals, and dwelling-houses ; viz. frequently white-washing the plastered

walls with lime, and washing the floors with strong soap-suds, or alkaline liquor ; at the same time taking every possible method to ventilate the apartments with fresh and pure air, and keeping its circulation and diffusion as equable as possible.

How much this practice of white-washing with lime, and other attentions to cleanliness in dwelling apartments, has to do in the prevention of disease, cannot be better illustrated, than from the account of a visit to Venice, while the plague was desolating the place, by that illustrious champion of humanity, the philanthropic Howard. His intention, by this, was to learn their mode of managing hospitals and lazarettos, and to be personally informed of their quarantine regulations.

——“ Soon after unloading the boat, the sub-prior came, and shewed me my lodging in the new lazaretto ; a very dirty room, full of vermin, and without table, chair, or bed. That day, and the next morning, I employed a person to wash my room ; but this did not remove the offensiveness of it, or prevent that constant *head-ache*, which I had been used to feel in visiting other lazarettos, and some of the hospitals in Turkey. My guard sent a report of my health to the office, and, on the representation of our consul, I was removed to the *old* lazaretto. Having brought a letter to the prior from the Venetian ambassador at Constantinople, I hoped now to have had a comfortable lodging. But I was not so happy. The apartment, consisting of an upper and lower room, was no less disagreeable and offensive than the former. I preferred lying in the lower room, on a brick floor, where I was almost surrounded by *water*. After six days, however, the prior removed me to an apartment in some respects better, and consisting of four rooms. Here I had a pleasant view ; but the rooms were without furniture, very dirty, and no less offensive than the sick wards of the worst hospital. The walls of my chamber, not having been cleaned for half a century, were

were *saturated with infection*. I got them washed repeatedly with boiling water, to remove the offensive smell, but without any effect. My appetite failed, and I concluded I was in danger of the slow hospital fever.

I proposed white-washing my room with *lime*, slacked in boiling water, but was opposed by strong prejudices. I got this, however, done one morning, through the assistance of the British consul, who supplied me with a *quarter* of a bushel of fresh lime for that purpose. The consequence was, that my room was immediately rendered so sweet and fresh, that I was able to drink tea in it in the afternoon, and to lie in it the following night. On the next day, the walls were dry, as well as sweet, and in a few days I recovered my appetite."

Is it wonderful that such places, as here described, should be subject to plague, or other malignant diseases? There is surely more reason for surprise, that places thus regulated, and under these circumstances, should ever be exempted from them. But what is most of all astonishing, is, that the disease should be ascribed to foreign origin, and not considered as engendered, nurtured, and brought up among themselves, and within their own walls! Surely, such people are deep in the *ditch*, if any blindness, or blind guide, can bring them there.

After attention to cleanliness in doors, the streets and alleys next are to be attended to: all putrescible substances must be carefully removed, by shovels, brooms and washing. "Multitudes of lives may be saved, and the loss of business prevented by these means; they are the guardian angels of public health."

It will be forever idle to sweep and cleanse the streets, lanes, &c. unless the back yards are attended to at the same time. The privy houses are a very great nuisance, and, together with the central burial grounds, contribute not a little to the source and spread of disease. The contents of these places, and other putrid matter on the surface of the earth, mix with and insinuate

sinuate into the soil around, till, reaching and contaminating the waters of the wells, render them, if not immediately poisonous, certainly nauseous and unfit for family uses. Besides, when the sun comes to act with powerful influence upon the earth's surface, a perspiration is excited, by which these noxious matters are thrown out, and raised into the atmosphere in the form of mephitic gasses; thus filling it with deadly miasma. Certain it is, that caloric, or the matter of heat, is the agent or efficient cause of all those mutations and evolutions of matter in animal and vegetable substances, denominated by fermentation and putrefaction; and by its agency on those substances, infection, or a septic atmosphere is produced, which gives origin to disease.

“The stimuli of putrid fevers, or the plague, and that of the mephitic, which is exhaled during the putrefaction of animal substances, in places where atmospheric air cannot enter, as in tombs and burial grounds, &c. are often very sudden and destructive in their effects, having such an affinity with oxygen, that as soon as they come in contact with the fibre, they deprive it of its oxygen, and produce death, frequently in an instant.

“The most efficacious mode of preventing the fatal effects of this gas, is, by the detonation of nitre upon burning charcoal. During the decomposition of the nitre, a considerable quantity of oxygen air escapes, and supplies oxygen, which combines with the mephitic air, rendering it harmless.” (*Moises on the blood.*)

Every spot of ground in cities, not occupied by some building, should be set with trees, balm of Gilead if they can be procured, of abundant foliage, and rapid and high growth; but not so close as to prevent the circulation of air. They will not only impoverish the earth, by absorbing its moisture, and with it the metallic effluvia, septic substances and putrid residua, injurious to animal life, the generation of which destroys the purity and healthy state of the atmosphere, by

by depriving it of its oxygene or elastic principle ; but they also *supply*, by their perspiration, this purifying matter, or oxygene, so necessary to animal existence, combustion, &c. ; and thus it is found, that trees, shrubberies, groves, &c. generate air, produce breezes and gales, which, agitating the common atmospheric mass, preserve it in its healthiness and salubrity.

What is nutriment to vegetables is poison to animals : while plants absorb azotic gas, or atmospheric mephitic, and emit vital or oxygenous air, man, on the contrary, exhales a considerable quantity of mephitic, and owes the continuance of his existence to the absorption of oxygene, or vital air ; and thus, by a kind of reciprocity of services, the two kingdoms would seem to labour for each other.

“The freshness of the country, the delights of spring, and all that infusion of health and spirits which we feel in a morning’s walk, are now no mystery : at that hour the plants are, by the sun and moisture, roused from slumber, their functions restored, and this work of reciprocity and mutual benefit begins. Perhaps there is not in all nature a more beautiful harmony than this, that the foul breath of animals gives life to plants, while the air, respired by plants, is useful to animals and delightful to man.”

By the vigilant attention of the Board of Health, by their personal exertions, together with a season for the most part cool and moist ; and, through the favour of *Him*, whom winds and seas obey, we are, and have been through this season, blessed with health, plenty and *peace*.

The Disease is not originated or propagated by any specific Contagion.

* Specific contagion is matter secreted in the human system by organic vessels in diseased or morbid action.

* In Mr. Webster’s Treatise, p. 141, *specific contagion* is defined to be a quality of disease, which, within a suitable distance, communicates it from a body affected with it to a sound body, with great certainty, and under all circumstances

action. One particle of this variola or secreted matter absorbed, will as infallibly produce the disease, as a much larger quantity. The matter of small-pox is of this description. Diseases from contagion prevail in all seasons and climates, when once communicated; but those who have been once the subjects of contagion are never afterwards affected by it.

No material of this description, and thus infallible and uniform in its effects, has ever been discovered in either the plague or yellow fever, if there is any difference in the diseases, except in degree of violence. Some physicians, however, assert that the matter from a bubo, one of the characteristic marks of the plague, when communicated to the system by inoculation, will produce the disease, and therefore adopt the opinion, that this disease, as well as the yellow fever, is specifically contagious. But it must be remembered, that all the experiments that have been instituted for ascertaining this fact, were at the time the disease was epidemic, and therefore it cannot with any propriety be insisted on, that the disease was produced by the inoculated matter, but by the same causes which produced it in others, who were not inoculated, or in any way exposed to persons sick of the disease. Besides, it should also be considered, that contagious diseases are gradual and progressive; uniform in their characteristic symptoms and term of duration, in all climates, and in every subject. This is not the case with the fever and plague. They are epidemic only in the southern latitudes, and in the warmest seasons of the middle latitudes; at other seasons, and in different circumstances with respect to heat, cold, moisture, dryness,

stances of season, weather, or situation. This contagion is of two kinds; first, that which acts by contact only, as that of the itch, leprosy, hydrophobia, and syphilis; secondly, that which produces its effects with equal certainty, by near approach, without contact, as that of small-pox and measles. That quality of disease, which may or may not excite it in a sound body, within a suitable distance, or by contact; and which depends on heat, foul air, an apt disposition in the receiving body, or other contingent circumstances, and which may excite the disease in the same person more than once, is called *infection*. Diseases from infection are either sporadic or epidemic, according to the nature and force of concurrent and predisposing causes. Contagion and infection have been used, throughout this Treatise, in the sense as above defined.

dryness, &c. the disease is only sporadic and mild. When the disease is highly malignant, it terminates within 48 hours from its commencement; on the third and fifth days, and seldom extends beyond the seventh day: but in the colder seasons, the disease not only becomes partially local, but is certainly changed in its symptoms, form, and time of duration; instead of 7 days, it sometimes runs on to the 11th, 15th, 20th, 30th, 40th, before a crisis.

“Specific contagion,” observes Dr. McLean, (and I shall make free use of his arguments) “I conceive, cannot produce a disease less uniform in its appearance, than small-pox and measles. But every epidemic and pestilential disease, which has hitherto been reputed contagious, assumes such various and dissimilar appearances, in different persons, that they cannot be the effect of any power, equal and uniform in its operation. The symptoms are not, in any two persons, exactly alike. Hence the difference of opinion among the physicians of Philadelphia, during their late epidemic; some asserting, that every disease had resolved itself into yellow fever, while others affirmed, that the diseases of the city were various. This dissimilarity of symptoms, which occasioned this difference of opinion at Philadelphia, is, to me, a convincing proof, were there no other, that the yellow fever of that city did not arise from any power, of such uniform operation as contagious matter. Like wine, opium, or mercury, specific contagion must produce similar effects upon all men, who are similarly situated. It must act alike in Egypt and in America, in London and in Constantinople. But according to all accounts, the symptoms of epidemic diseases, in different parts of the world, are very dissimilar; while those of diseases, that are undoubtedly contagious, such as small-pox, measles, lues venerea, &c. are the same in all. Wine will intoxicate, cathartics will purge, mercury will salivate in all countries. They will produce these effects upon almost all men; certainly

tainly upon all men in health. Those only, who are in a state of disease, higher in degree than those powers can produce, will resist their operation. But this proportion cannot be one in a thousand, perhaps not one in ten thousand. Such also may be the proportion that would escape from the effects of a specific contagion applied to them. It is common, however, for men in health to be exposed to contact with the sick, and to escape. In that case, contagion, if the disease had been contagious, must inevitably have been applied ; and without producing its imputed effects."

It is a fact, attested by many medical writers, that persons are liable to be attacked, both by the plague and yellow fever, an indefinite number of times ; but this is not characteristic of such diseases as are allowed to be contagious.

Another fact, and the same is noticed by the writer just quoted, women, children, and the aged, are peculiarly exempt from the disease ; this certainly has been the case, while the disease prevailed here in 1796, and the last year, 1798. But if contagion was the source of these epidemic diseases, the case would be exactly reversed : old people, women and children, being more frequently in the way of contagion, because more confined, would be more frequently and more severely attacked.

We repeat then—the fever or plague is *not* contagious, or propagated by any specific matter ; we make the assertion the more confidently, not only as it results from our own observation and conviction, but also because it is the concurrent opinion of a majority of physicians, in all countries, and these not the least respectable. We begin first at home.

Dr. Warren says of the last epidemic, 1798, Boston—"That the fever was in a degree contagious, I cannot entertain a doubt ; but that it was not so in a very high degree, I am as fully persuaded from the number of cases in which there was reason to believe it
could

could not have been taken in that way. In most instances, where contagion might have been *suspected*, the subjects were so situated, that they might have received it from the *same source* as those with whom they had communicated. I cannot learn that any evidence has been furnished of infection from the sick, who had been removed into the country, though there were instances of such removals, under *the most malignant forms* which it assumed.—I venture to assert, that not a physician in town, young or old, will go further in advocating the contagious nature of the disease, than Dr. Warren has here done. He admits that it was “in a degree contagious;” but I presume only in the manner that Dr. Rush holds it to be contagious; not from any specific matter, secreted or produced in the system by the operation of the disease, but only

“If the breath, perspiration, and other excretions of a person, in a yellow fever, be confined in a small close room, they may produce a similar disease, especially when they act upon a body previously debilitated by grief or fatigue. But they are generally inoffensive, where the sick are accommodated in open, well ventilated situations. Out of upwards of one thousand persons, who have carried this disease into the country from our cities, there are not more than three or four instances to be met with, of its having been propagated by contagion. In the city hospital of Philadelphia, there was no instance of this disease being contagious, in 1793, 1797 and 1798. Clothes, impregnated with the effluvia of a person who had died of the yellow fever, might produce a similar disease, but it would be only in consequence of those effluvia partaking of the nature of putrid matters, derived from any other animal source. The same thing may be said of the effluvia emitted from a putrefying dead body.”

Dr. Mitchill, in a letter of August 28, 1799, says—
“The experience of this season is *most powerful and decided against its contagious nature*. I have heard of no

M

instance

instance that looks like catching it by infection. Common *septic* fluids, existing in the form of liquids in the alimentary canal, or *gasses* in the atmosphere, appear to be the grand agents of mischief."

Drs. Huck, Hillary, Hunter, M'Lean, Clarke, Jackson, Borland, Pinchard and Scott, physicians to the British army in the West Indies, and many more, deny the contagious nature of the yellow fever, as it there existed.

In the several accounts of this fever, as it has appeared in Philadelphia, New York, Boston, and in the other places on the continent, since 1793, it does not appear that the mortality has been greater among the physicians, nurses, and other attendants on the sick, than among the other inhabitants; although vastly more exposed to the disease, being from the nature of their employment almost constantly among the sick, dying, and the dead. We leave it to the ingenuity of those, who hold the opposite opinion to ourselves, to reconcile this fact with the acknowledged equal power and operation of contagion upon all constitutions.

It seems to be a fact, granted by all the writers on the subject of the plague and yellow fever, that when it becomes epidemic, it has invariably *first* appeared and spread among the poorer class of citizens. This could not be so uniformly the case, if it had been produced by specific contagion, because in this case it would be as likely to take rise *first* among the more wealthy and cleanly part of the inhabitants, as with the poorer; for specific contagion operates uniformly and indiscriminately alike upon all constitutions, sexes, ages and descriptions of people. And besides, the fever has been known to appear, at one and the same time, in all points of the compass of a large city, and in places quite apart of each other; but, observe, always in places where the atmosphere has been materially impaired, either by compact situation of the inhabitants, or by noxious collections from them. But
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this could not happen, if the disease were originated by one single atom of specific contagion (and this is all that is necessary if it be specific) wafted thither in the simbræ of a *particle of smoke*, or perhaps in the chinks or stitches of a sailor's jacket ! How it comes here, or what it is when it is here, we are not informed, otherwise than that it is *contagion* ; a word which, instead of conveying any distinct idea of the matter of disease, oftener betokens the credulity or theoretic prejudice of its advocates. It would seem to be originated much in the same manner as some divines hold the world to be created—out of *nothing*. Indeed, by a late writer of the history of the plague and yellow fever, (who is really a man of extensive information, and well read in history, as his book evinces) it is not allowed to be *any thing* ; consequently it is *nothing*. “ If (he asks) the yellow fever is produced by the effluvia of marshes, by putrid steams, or by *any thing else*, how comes it to pass, that it has been so frequently in the United States, since the year 1792, in comparison of what it was for 30 years before ?” (Dr. Rush has given a full reply to this query, which I shall insert by and by.) Thus it appears, that neither the effluvia of marshes, putrid steams, nor *any thing else*, can be the cause of fevers ; but it must be *contagion*, “ *specific and immutable !*”—*uncreate, indestructable and eternal*, and the definition would have been complete ! We are not informed, whether this contagion, “ *not any thing*,” is animate or inanimate ; though we find, from Dr. Waterhouse, that it has sufficient agility to bestride a *particle of smoke*, and, after thus travelling a considerable distance, commence an attack upon the constitution, with as much force and certainty of effect, as when, in another instance, it was transported in the curls of a *wig* !

“ In short, (concludes Mr. Tytler, p. 470) *contagion*, being a power certainly known to exist, though invisible and imperceptible, it is impossible ever to prove that it is absent ; neither, after the contagion of any disease

disease has once got into a country, can we be assured that it may not revive. The experience, we may say, of the whole world testifies, that it does adhere particularly to clothing. Dr. Lynd thinks it may adhere to the timber of ships; and there is the greatest reason to believe, that it may also adhere to the walls of apartments in houses. The appearance of fever, therefore, without any new importation, cannot prove that it has not arisen from contagion." I am astonished! Is it possible that these are the assertions of the compiler of the "Medical Parts of the Encyclopedia Britannica!"

Is contagion a power "certainly known to exist?" and because it is "invisible and imperceptible!"

Mr. Tytler seems to laugh at those, who ascribe the disease to a particular constitution or temperature of the atmosphere, which he says "is something *unknown*; and when people appeal to it, it is only in other words owning their ignorance."—Now, I am so ignorant, as not to *know* nor *see* the difference between what is *unknown*, and what is *invisible* and *imperceptible*. Can we have any *experience* of what is *imperceptible*? and is there "the greatest reason to believe, that it (contagion) may adhere to the walls of apartments in houses, to clothes, to the timbers of ships," because it is "invisible and imperceptible?"

"Contagion, being a power certainly known to exist, though invisible and imperceptible, *it is impossible ever to prove that it is absent*; the appearance of fever, therefore, without any new importation, cannot prove that it has not arisen from contagion." This, perhaps, the author considers a philosophical and logical deduction. *Invisibility* and *imperceptibility* is proof of its *presence*, but to prove it *absent*, something else is necessary!!—Well, perhaps it must be *annihilated*; but this cannot be, for it is "*immutable*;" and what is immutable, cannot be changed or destroyed.

(Page 467.) "From all this (supposed facts) it appears how difficult a task they undertake, who contend
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for the domestic origin of the yellow fever, without contagion. In all cases, they must have recourse to something *visible* and *obvious* to the *senses*.”—Yes, Sir, and we leave it with you, and those of similar sentiments, to trace the disease from what is “*invisible, imperceptible, specific and immutable*.”

With respect to the time in which this invisible and imperceptible contagion produces its effects after its application to the body, “much must depend on the *quantity* ;” that is, of what is *invisible* and *imperceptible*. But this assertion makes against what has been asserted of the specific nature and immutability of contagion. If it is immutable, it must be invariable in its effects, both as to the time they are produced, as also, as to their number, kind and degree. This seems also to be Mr. Tytler’s conclusion. “Thus the contagion of the small-pox, whether existing in the matter of a pustule, in the *smoke* of burning clothes or paper, or in the effluvia of blood, is *invariably* the same, and never produces any other disease.”

(P. 468.) In order to reconcile us to what has been said, and to do away what perhaps “may appear rather in a *ludicrous* point of view, to those who deny the existence of contagion,” we are told of the surprising and instantaneous effects of animal poisons. Remember the definition of contagion, (*specific, immutable, invisible, imperceptible*) and observe how its quantity, volatility, materiality, &c. are spoken of. “If we consider the instantaneous and inexplicable action of the poison of serpents, and how little time they produce a mortal disorder, or even death itself ; when we consider that contagion is only a volatile poison, and that it for the most part takes up an inconceivably larger time to bring on death, than the bite of some venomous animals, we cannot be surprised that a *quantity* of this *volatile matter*, inconceivably *less* than that of animal poison, should be capable of bringing on the disorder ; for the length of time may be supposed to make up for the deficiency of quantity.

Yet,

Yet, if we consider the extreme activity of some animal poisons, the wonder at the small quantity of contagion necessary to produce a deleterious effect, will in a great measure cease. It has been observed, from Dr. Mead, that the whole quantity of poison, emitted by a viper, when it bites, does not exceed the bulk of a *good drop*. The effect of the *furia infernalis* of Linnæus is still more to our purpose. It is an insect, found in the forests of Kemi, in Lapland, and likewise in Sweden and Russia. This insect falls down out of the air, and, if it happens to light upon any uncovered part of the human body, it almost instantly penetrates down to the bone, occasioning the most excruciating pain, and death in a *quarter of an hour*. Now, should we suppose the whole body of this insect to be poison, as it is possible that it is not, it is so minute, that though the whole were volatilized into contagion, it might be well supposed to adhere to a *wig*, or even a more diminutive part of the clothing; and considering the virulent effect of even this small quantity of contagion, when communicated, it would easily follow, by fair calculation, that a very *minute proportion* of even this *small quantity* might bring on a dangerous disease."

I should like to know by what means or instrument we might calculate the danger of a disease, brought on by "a *very minute proportion* of a *small quantity*" of *invisibilty* or *contagion* of fever.

I do not believe that this insect, the *furia infernalis*, can penetrate and kill, thus suddenly, unless it should happen to fall upon some important part or organ of the body, immediately connected with the vital principle, any more than that *whole forests of Norway are burnt up by the heat of the sun*; both these facts rest upon equally respectable authority.

"Contagion is only a volatile poison; and for the most part takes up an inconceivably longer time to bring on death, than the bites of some animals;" and "the *length of time* may be supposed to make up for the

the *deficiency of quantity*." That is, if a quantity of volatile poison, or contagion, "specific, immutable, imperceptible, and invisible," be "concentrated" into a "*good drop*," (invisible) it will kill as suddenly as the bite of a viper.

"From all this it appears how difficult a task they undertake, who contend for the domestic origin of the yellow fever, *without contagion!*" Surely: and we have now full conviction with what wonderful facility, difficulties, of *Chimborazean magnitude*, may be pushed out of *sight*, by the *apparent* agency and *imperceptible* power of an *invisible* contagion.

"It is indeed too common for people to laugh at what they cannot answer." Perhaps if this mode of confutation had been *fully* adopted by the author, it would in the present instance have proved the most successful, if not the *only* mode of obviating the arguments of those, who contend for the domestic origin of the disease.

But to return.—

Adverting to analogy, we find it abundant in the supply of argument, supporting the opinion we have advanced concerning the origin of the disease; and these are forcible and conclusive in their kind. It might as well be affirmed, that the *rust* and *blast* of certain kinds of grain were the effect of the operation of contagious matter, as that diseases of fever are thus brought about, which seem to be as much limited to season in their appearance, at least in their kind or degree of malignancy, as these phenomena of the vegetable world. Certain tribes of worms and insects, which often make destructive ravages upon the foliage of certain trees, particularly the apple-trees, and also upon other species and tribes of vegetables, sometimes to such extent, as often to endanger a famine, appear and disappear only in certain seasons and periods of time. But this appearance and disappearance of these devouring insects, has, I believe, never been attributed to the operation of contagion. The more
general

general opinion is, that their existence or return depends upon some peculiarity of season and temperament of atmosphere; and the same thing I believe will be found true of the *rust* and *blast* of grain. This circumstance suggests to us the idea, that certain species of disease, particularly the malignant fever, may depend upon the same, or some similar and general cause; viz. some peculiar temperament or vicissitude of atmosphere, either general or local. We shall enlarge upon this idea, after the following forcible and conclusive arguments, against the contagious nature of epidemic diseases, are inserted.

“It is well known, that, in hospitals, camps and ships, a very small proportion only of those, who sleep within a short distance of, are frequently in conversation, or even in contact with, persons ill of typhus, dysentery, or fever, is seized with these diseases. So far from infection being invariably communicated in this manner, no instance of it has ever been distinctly traced. If such cases had ever been recorded, we must either reject them as false, or abandon one of the fundamental axioms of philosophy. For, whatever has happened once, must happen often; it must happen *always* in similar circumstances. But in the situations alluded to, these circumstances constantly occur, and the alleged effects do not follow. It is not fair to conclude, that dysentery is contagious, because one person happens to be taken ill, while in the neighbourhood of another who had got the disease. If the conclusion was just, all within the infectious distance, not labouring under a disease higher in degree, would be similarly affected. They would have the disease with as much equality of force, as children have the small-pox. In proportion to the number affected, the power of contagion would increase. It would proceed in a geometrical ratio, diverging from the centre to every point of the circumference of a city, a camp, an hospital, or a ship. It is evident, then, that in these situations, a contagion, which had the power of
producing

producing its peculiar disease, in the same person, more than once during life, would never disappear. But dysentery, fevers, and the plague itself, cease in all those situations, without having affected perhaps a tenth part of the community. They cease, too, when they are epidemic, according to some periodical law, which evinces, that they do not arise from any casual and uncertain source, like the accidental application of contagious matter."

There seems to be something in the atmosphere of cities, and of all places of compact habitation, favouring the origin and spread of epidemic diseases. This is made evident by a variety of facts and considerations.

Dr. Rand has stated, that the atmosphere of those places, where the disease was most prevalent, in 1798, (Boston) was so thoroughly impregnated with contagion (infection) as to be very perceptible to the smell and taste, exciting the same sensation as a weak solution of corrosive sublimate of mercury. (Med. Rep. vol. II. p. 471.)

Another accurate observer of facts and natural phenomena informs, that "The month of July, 1798, was pleasant, and by no means unusually hot, except the *first* three days, and the *last* three days of the month, when the air became remarkably calm, and the heat was excessive to the 25th of September, when a total change ensued, with violent gales of wind from different quarters.

"The course of the wind was very regular, almost every day, for six weeks. Early in the morning, it was generally light from the northern quarter, and gradually veered to east and south-east, with a light breeze somewhat stronger than in the morning, to the southern quarter, and gradually lessened to a perfect calm by the time of the sun's setting, which was constantly obscured by a dark red tinge, which increased generally to such a degree, as to entirely conceal its body before it sunk below the horizon, with the appearance of a black bank of smoke.

The atmosphere seemed to have so little motion, during the above period, as scarcely to change its relative situation, except in a circle round the town. Sounds and smells were propagated in every direction, without any apparent check from the current of air.”*

Cities, for the convenience of trade, are for the most part situated in low and level places, and such as are favourable to the accumulation and retention of filthy materials, the unavoidable consequence of compact habitation. It is here also, that putrefactions of all kinds, together with combustions in houses, distilleries, glass-works, and in all the various kinds of manufactories, carried on upon an extensive scale, take place, by which the proportion of oxygenic requisite to the healthy constitution of atmosphere is consumed, and its azote or septon increased. Now, it is a certain fact, that this vital air, or oxygenic, one of the constituents of atmospheric air, is as necessary to

* Mr. Webster is positive in the opinion, that at least the quality of atmosphere is stationary during the continuance of an epidemic disease. (P. 143.) “Certain it is, that no force of wind whatever ever expels from a town, or lessens the pestilential virus, without the aid of other causes.” (P. 321.) “Is not electricity the basis of the common atmosphere, and immovable by wind? And does not a pestilential air consist partly in some combination of this element, with other aerial substances, which are not moved by wind? This is suggested merely for consideration; it appears to me improbable. Frost destroys the pestilential condition of the atmosphere, and this is supposed to act upon the deleterious substances arising from the earth, or human body. Besides, a pestilential atmosphere rises but a few feet above the earth, which indicates that its pernicious qualities are dense and gravitating substances.”

“Indeed, two causes seem to concur in the origin of pestilential fevers; an electrical condition of the atmosphere, which renders the nervous system extremely irritable, and the body of course prone to fever; and a collection of morbid matters arising from living and dead animals and putrefying vegetables. Wind may remove the latter cause, if accessible, which, however, is never the case in large cities; but cannot affect the influence of the former. Frost has access to all morbid causes, and renders them inert. It also reduces the stimulus, acting on the human body, and renders it less irritable. But the electrical stimulus remains. Hence, although the progress of the fever is arrested by cold, the type of it is visible in the diseases of the winter. The irritability, from electrical causes, still remains; and gives to the fevers of winter the peculiar symptoms of pestilential or typhus pleurisy, and peripneumony.”

Mr. Webster mentions morbid matters from *living* bodies among the causes of pestilence. He is persuaded that perspiration furnishes more poison than streets and alleys. It fills all close rooms, especially bed-rooms; in close-built streets, it infects the very atmosphere; and a more virulent poison does not exist, than perspirable matter in a condensed and fermenting state. This can only be destroyed by a liberal use of water.

to the support and health of animal life, as of flame or combustion ; and it will be found, invariably, that fibrous irritability and muscular power will vary with the degrees of excess or defect of this principle in the system, imbibed from without. Besides, all bodies have density and weight, only as there is more or less of the acidifying principle concentrated in them. If, then, this principle be diminished in the atmosphere, and extracted from substances and matters on the surface of the earth, either by the above mentioned processes of combustion, putrefaction and animal respiration, or by the excessive heat of the sun ; those materials, innoxious only when embodied and confined to the earth's surface, are, by the agency of these powers, levigated, become volatile, float in the atmosphere, and quickly predispose to disease ; which, under these circumstances, is easily excited by the smallest derangement of the animal functions.

Another fact it may be well here to mention : The quantity of oxygene, elaborated and given out by vegetable perspiration, becomes comparatively small at the period when putrid diseases generally make their appearance ; viz. July, August and September. The affair of Calcutta is also to our purpose. Capt. Holwell, with about 140 others, were, by order of the governor, thrown into the *black hole* of Calcutta, ventilated only by one small window ; they were so crowded and huddled together, that they could scarcely move. The respirable portion of the atmosphere was instantly consumed ; the heat became excessive, the perspiration profuse, and the thirst intolerable. The animal powers were soon exhausted, and they all perished except the small number of twenty-three, who, when taken out, were immediately seized with the typhus fever. Now, all this, it is evident, was occasioned by a want of pure air, or the vital portion of it ; and so great was the demand for it, and so great the difference of temperature between the atmosphere of this *hole* or prison, and the natural and healthy

healthy temperature of the body, that the oxygene began instantly to quit its hold and combination with the gasses and fluids of the body, in order to escape and restore the equilibrium; by which means the healthy arrangement of the fluids was immediately disturbed, and their dissolution effected, as is evident from the profusion of perspiration, and also from the eruption of biles in those who survived the night.

Diseases of debility or weakness are more frequent in cities than in the country; viz. among females, hysteria, mœnorrhagia, fluor albus; these are the soonest and most effectually cured by exercise and residence in the country. Florid consumptions and hectic complaints, on the contrary, are relieved, sometimes cured, by residence in the city, and by sea voyages. The complexion of country people is florid and robust; in the city, it is pale and wan; the fibrous energy and muscular force less vigorous and sooner exhausted.

Dr. Clarke, in his treatise on the fever of Grenada, observes, that “when emigrants fled towards the mountains, where the air is very pure, they always avoided an attack of fever, or soon recovered if in a convalescent state.”

But putrid and malignant diseases are not alone confined to cities, and thick settled places; they are also, and almost always, the constant attendants of fleets and armies; and why? not because they transport specific contagion, as they carry powder and ball; but because in this perverted, I had almost said infernal state of man, the filth they accumulate in their clothing, bed furniture, among the materials for cooking, &c. &c. renders the air in their encampments as noxious as the climate of Java, and in some instances as poisonous as the effluvia of the Bohan Upas. O! brethren of the human race! why will ye bite and devour one another? the rather, why will ye not turn away from wrath, assuage the spirit of revenge, and, by cultivating the benevolent and social affections,

tions, endear yourselves to HIM, who is equally desirous of the good and happiness of *all*.

All the above facts, brought into one connected view, afford pretty full proof of what has been asserted; that there is some peculiarity of atmosphere in cities and closely inhabited places, congenial to the origin and spread of putrid disease.* What it is that produces this peculiarity, is an important *desideratum*. Dr. Mitchill thinks it is septon, the peculiar product of animal putrefactions, simply in itself, or in various degrees of combination with oxygene, forming septic acid gasses, and noxious, according to the degree of concentration of the acid principle in the septicous bases.

Dr. Clarke ascribes the fever of Grenada, 1793, 4, 5, 6, to a peculiar derangement of the component parts of the atmosphere, which he thinks was "effected by the strong light and intense heat of the sun, having disengaged, or formed some combination with its vital part, or a certain portion of it, which being so united and rarefied, would rise far above that stratum of air, in which we, in lower situations, breathe, leaving the mephitic or heavier part near to the surface of the earth. The loss of a small portion of vital air would render this lower stratum very unfit for respiration, and of course very unwholesome to live in: the air in respiration, in this case, not having a sufficient quantity of oxygene, may occasion a deranged state of the fluids, which I conceive to be the immediate stimulus or excitement, or what may be termed the proximate cause of the fever. And if the biliary secretion be intended for the discharge of the degenerated

* "Pestilence has always been the *peculiar curse of populous cities*. Of about 200 general plagues, recorded in history, a few only have been so violent as to spread over countries into villages and farm houses; almost all have been limited to large towns, evidently demonstrating, that they would never have affected mankind, without the influence of impure air, generated in those places. This is a truth, as unquestionable as it is important; and on a conviction of this, hangs the safety of men from that dreadful calamity. Had Mead, and other eminent physicians, taken the same pains to lead mankind into truth, as into error, we should long ago have introduced improvements into the arrangement and structure of our cities, which would have secured our citizens from nine-tenths of the infectious diseases, by which they have been alarmed and distressed." (*Webster*, p. 209. vol. II.)

crated lymph and crassamentum of the blood, as Dr. Maclurge thinks, in his dissertation on the bile, the great redundancy and degeneracy of the bile in this fever may be easily accounted for, on that principle. This derangement may be the cause of an increased determination of the fluids to the liver, and as the morbid animal process gains ground, which it does every hour, if not opposed by powerful remedies, the liver becomes more and more distended with blood, and the biliary secretion is increased and hurried on in such a rapid manner through the extremities of the pori biliarii, that it resembles grounds of coffee rather than bile, which, upon a narrow inspection with a magnifying glass, seemed to be dissolved blood, floating in lymph or mucus. When the blood, dissolved by this morbid process, meets with any obstruction, it gushes from the nose and mouth in almost a colourless state, and in such prodigious quantities, that the patient soon sinks into a state of total dissolution.

“There appears to have been such an extensive and peculiar deranged state of the atmosphere in the towns in these islands, and in North America, that it is more than probable this disease was produced by *this general cause*, it breaking out nearly at the same time in different places, than that it originated *only in one or two towns*, and was carried from thence by infection to others, by either persons or goods, as has been supposed. The regular return and continuance of this fever, in the months of July, August and September, every year, more or less, since its first appearance in these islands, and in the towns in America, seems to me to argue strongly in favour of this opinion.”

The great influx of Europeans, and from northern latitudes, and the concurrence of other casual circumstances, occasioning this unusual depravity of atmosphere, was the only cause of the difference of malignancy between this and the common bilious or autumnal fever, in the opinion of Dr. Clarke.

“The vicissitudes of the atmosphere (says Dr. M’Lean) constitute a power, great, evident, and extensive

tensive in its effects upon the animal and vegetable world : a source, to which the epidemic and pestilential diseases of living bodies may with certainty be traced. Whereas, contagious matter is a power, that has uniformly been taken for granted, without examination ; of which the existence, in epidemic and pestilential diseases, is even disproved by a numerous induction of facts ; and, if admitted, is incapable of explaining their phenomena.”

The facts and considerations, already adduced, separate of what might be further observed, shew sufficiently clear, that those only are rightly denominated contagious diseases, which invade the constitution only once ; which act, with almost equal effect, upon every variety of constitution, and temperament of body ; which always bear the same type, and are invariable in their characteristic symptoms ; and which are not changed, in these respects, by climate, or by any variety of atmosphere : but those diseases, which are either sporadic or epidemic, according to the quantity and degree of heat, cold and moisture, or which vary with the states and conditions of the atmospheric elements ; which are confined to particular complexions, constitutions and climates ; which are capable of every degree of variation in type and symptom, from the mildest form, up to the highest degree of malignancy ; which invade the constitution an indefinite number of times, and with the greater malignity the oftener it has been attacked, are not specifically contagious ; they may be called infectious, if by infection we understand the effluvia of putrescent substances, elevated by heat, and then denominated the gaseous oxyd of azote ; or, combined with oxygen, forming septic acid gasses. Inasmuch as these materials, thus produced, and diffused in the atmosphere, thereby destroying its salubrity, and occasioning such a depravity as to give rise to putrid diseases, either sporadic or epidemic, according to the locality or more general extent of the pestilential atmosphere,
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it is accurate to say, that such diseases depend upon certain states or certain vicissitudes of the atmosphere, together with such other causes as produce debility in the constitution.

The beneficial consequences, which would result from a full and an implicit adoption of the doctrine above advanced, are numerous and important. In general, we should no longer find men wasting their time and ingenuity in insisting upon an ideal being, a *something* and a *nothing*, as the source of epidemic disease, and in tracing it from city to city, from continent to continent; which, when traced to where they *choose* to find it, will not allow it to be any thing obvious to the senses; cannot be known by any chemical test; is "imperceptible," &c. &c. On the contrary, we should see that the source of mischief might be among ourselves, and is the offspring, however monstrous, of our own vices; by these it is nurtured; the parentage and filiation is wholly ours. We should be convinced, that there is not a city or town, in any climate, sea-port or inland, house or habitation in either, wherein malignant diseases may not originate. The regulations, necessary to cleanliness, in doors and out, would be unremittingly attended to; and any thing that might tend to destroy the healthy temperament of the atmosphere, either generally or locally, would be immediately proscribed, by those invested with adequate authority. Physicians would no longer approach the sick bed with as much reluctance and cautious fear, as if they were advancing to the *rack*, or other apparatus of Popish inquisition. On the contrary, they would speak words of comfort to the sick, cheer him with rational hopes of recovery, dispel the frightful apprehensions of immediate dissolution, and, by thus fortifying the mind, by the invigorating power of hope, give efficacy to prescription, and arrest to the disease. Still more; "the adoption of this theory, by recalling physicians from a wrong track of investigation, would
probably

probably be the means of enabling them to apply principles to the cure of all epidemic diseases, hitherto so often fatal, which would render them little more dangerous than common fevers. Instead of wasting time in tracing contagious matter from city to city, they would endeavour to discover what are the particular states or vicissitudes of the atmosphere, which produce epidemic diseases; what are the causes of these vicissitudes; and what are the best modes of counteracting their effects upon the human body."

By Dr. RUSH.

"IT has often been asked, *Why did not the yellow fever prevail in Philadelphia before the year 1793, particularly in the year 1778, when it was left in a more filthy state, by the British army, than it has been at any time since?* To this I answer, that for the production of our pestilential disease, three things are necessary: 1. Putrid exhalations; 2. An inflammatory constitution of the atmosphere; and 3. An exciting cause; such as great heat, cold, fatigue from riding, walking, swimming, gunning, or unusual labour; intemperance in eating or drinking, ice creams, indigestible aliment, or a violent emotion of the mind. The first cause acts but feebly without the concurrence of the second, producing mild diseases only, such as common remitting and intermitting fevers. By the co-operation of an inflammatory constitution of the air, we observe not only common bilious fevers have become malignant, but all those diseases which are occasioned by the sensible qualities of the air, have assumed a more violent character. This has been remarked by most of the physicians of Philadelphia for several years past. The pleurisy, rheumatism, gout, hives, and several other diseases, require remedies of twice as much force to subdue them, as they did ten years ago. On what circumstance this change of the

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atmosphere depends, is not known. But the fact is certain. It was taken notice of by Hippocrates, two thousand years ago, and is mentioned over and over in the writings of Sydenham. The records of medicine prove, that it has continued from one year to fifty-two years in different countries. Dr. Sims has given a long and interesting account of these inflammatory constitutions of the atmosphere, from the year 1590 to 1782, in the first volume of the Manchester Memoirs, from which it appears, that they were sometimes general over Europe, and at other times confined to particular countries. The pestilential constitution of the air, in the United States, began in 1791. This I infer from the yellow fever making its appearance that year in New York. It prevailed in Charleston, in 1792, and it has been epidemic in one or more of the cities and country towns of the United States every year since.

“As a further answer to the question, it might be asked, Why was not the fever imported oftener before the year 1791? It is seldom absent from the West Indies. It raged in most of them during the two wars previous to the present, and yet but one instance occurred of it in the United States, in those two periods of seven years each, and that was in Philadelphia, in the year 1762. The intercourse between our cities and the islands, during that time, was extensive and constant; particularly in the war between the years 1756 and 1763. Quarantine laws then existed in but few of our cities, and where they did, they were feebly executed, or eluded every day.

“It has been asked,

“*Why does not the yellow fever prevail every year, in cities where the filth is always the same, in its quantity and quality?* To this I answer, that filth may be in two states, in which it will not produce this disease; viz. a *dry* and a *liquid* state. From excessive heat, or from heavy rains, it is often in one of those conditions in our cities. When this is the case, they escape a visitation

tation from this disease. It is only when filth is acted upon by a hot sun, in a *moist* state, that it produces fever.

“Philadelphia (concludes Dr. Rush) was once pre-eminent over all the cities in North America, in plans of public utility and happiness; she *must* admit the unwelcome truth, sooner or later, that the yellow fever is engendered in her own bowels, or she must renounce her character for knowledge and policy, and perhaps with it, her existence as a commercial city.

“May Heaven forbid this catastrophe to the capital of the United States! and in mercy command the destroying angel of pestilence to sheath his uplifted sword! In spite of the numerous execrations, that have been heaped upon me, for opinions and conduct upon the subject of this address, by the citizens of Philadelphia, her prosperity is still the object of my constant solicitude. Yes—dear asylum of my ancestors! beloved nurse and protectress of my infant and youthful years! may thy health, thy commerce, thy freedom and thy happiness, exist till time shall be no more!”

WE have been politely favoured with an accurate registry of the variations of the weather, and temperature of atmosphere, from the 1st of July to the 1st of November. Nothing but the circumstance of having already extended the Treatise beyond the prescribed limits, prevents its being inserted entire. Abridged, we find it varies but little from that given by Dr. Rand, for the same season,

“The state of the atmosphere, in the month of May, was warm and pleasant. Fahrenheit’s thermometer ranged from 48 to 82 degrees, at 2 o’clock, P. M. Twelve days the mercury stood from 60 to 82. Nineteen days from 48 to 90, with alternate rain and sunshine. Some few persons laboured under rheumatism,

matism, some with asthma; and few had the typhus mitior this month.

“June was pleasantly warm, with the winds for 17 days from south and south-west, three days south-east and east; four days the wind blew from the north-east, when the weather was cool and cloudy, with rain. The remaining six days, west and north. It thundered, with small showers, the 3d and 29th. Thermometer ranged from 56 to 83, only one day 56. Twenty days from 70 to 83. Nine days from 65 to 70. Fevers, with inflammatory symptoms, pleurisy, bilious and inflammatory fevers, ophthalmia, and few cynanche parotidea.

“July was hot and sultry. The south and south-west winds prevailed 18 days. Small showers, with thunder, 8th and 29th. The range of the thermometer was from 72 to 96, excepting 3 days it descended to 67. Typhus gravior, and in some instances the yellow fever.

“August, the south-south-east and south-west winds prevailed 23 days. The remainder it varied from west and north-west to east and north-east. It rained the 5th, with thunder; 12th, small showers; 21st, cloudy with thunder; 26th, rain. Thermometer ranged from 72 to 94; the 20th and 23d, 67 and 69; healthy, except the contagious fever.

“September, light breezes from the south-west, south and south-east, prevailed 22 days. Very little rain this month. Part of this month hot and sultry. Thermometer ranged from 56 to 77. The night of the 29th, a frost. The fever the latter end of this month abated.

“October, the west and north-west winds blew 13 days; variable from north-east to south-east, the remainder of the month. The 7th, a great storm with much rain; a severe frost 29th, which arrested the further progress of the contagious fever. Thermometer from 30 to 36.” (See *Med. Rep.* vol. II. p. 446.)

*"A CATALOGUE of the Names of adult Persons,
who died in BOSTON, during the prevalence of the Yel-
low Fever, or Plague ; beginning July 21st.*

"N.B. Those with this mark (x) prefixed are supposed to have died of the epidemic. But it is very probable it may be affixed to some who died of other disorders; and so vice versa. It is to be noted, also, that the Catalogue must be very defective, as it was impossible to collect all the names. So far as it goes, it may be depended on; but there certainly must be a deficiency of numbers.

"The names of young children were never brought into the Catalogue.

"A few names have been inserted, of such citizens as manifestly carried the disorder out of town, and died after their removal.

"It is to be lamented, that any embarrassments were thrown in the way, so as to deprive posterity of a *perfect* Catalogue. A few deaths by the fever happened previous to this date; but the number is not ascertained. Many names are doubtless mis-spelled; and some Christian names could not be obtained.

"CALEB BINGHAM."

BOSTON, 1798.

July 21. Thomas Frazier
John Atkins
22. x John Hunt
Elias Parkman
Mercy Brazier
23. x John Bowman
John Ewer
John Knowles
Sally Wheeler
x James Waterman
29. x Andrew Newell
x Robert Paine
x Benjamin Stone
John Oden
John Dennis
29. x Joseph Bragdon
Rebecca Fobes
30. x Benjamin Luckis
x Wentworth Downes
x Joseph Scott
x Donald Campbell
x William P. Selby
William Joseph

July 31. x Samuel Bradlee
x Rachel Tarball
Aug. 1. x Joseph Whittemore
2. x Bartholomew Rand
3. x James L. Homer
4. John Hewit
5. Benjamin Loring
x John Lebaron
6. x James Pitts
7. x William White
x George Roberts
John Robertson
Samuel Holland
——— Lochlin
x Francis Smith
8. x A Sailor from Fore-
Street
x William Thayer
9. x A Sailor from Long
Wharf [Dock
10. x A Man found at T.
x Duncan Mackintosh
Samuel Dill

- Aug. 10. Martha Callender
 11. x Henry Lovering
 12. x A Man from North Square
 13. x John B. Marshall
 14. x James Gordon
 15. x Timothy Atkins
 Patrick Bryant
 16. x Mercy Wheeler
 x Mrs. Davis
 x Mr. Welsh
 17. x Francis Bigelow
 Rebecca Torrey
 A Person from the
 Alms-House
 x A Man from Fish-
 Street
 William Kimball
 A Man from the Alms-
 House
 18. x Mary Atkins
 19. x Sarah Atkins
 x Matthew Clarke
 21. Elizabeth Whittemore
 22. x John Smith
 x Judith Adams
 ——— Watts
 Nabby Sewall
 23. x Sally Thomas
 x Thomas Chamberlain
 x John Buckley
 x Mehetabel Gree-
 nough
 24. x Priscilla Patten
 x Lydia Burrill
 x Mrs. Greenough
 x Elijah Adams
 25. x Sukey Howard
 x Samuel Barrett
 x A Black Woman
 x Patty Hopkins
 26. x Jonathan P. Barton
 x Nathaniel Cade
 x Horace Wells
 Thomas Crafts
 Richard Gridley
 x John Bafs
 Amos Ballard

- Aug. 27. Mrs. Frobisher
 A Stranger
 x Lewis Thomas
 x Thomas Temple
 28. Benjamin Darling
 29. x Thomas Stimpson
 x Abigail Welsh
 30. x Thomas Amer
 x Thomas Curtiss
 x Dorothy Reynolds
 31. x Shippie Townsend
 x Sally Hufe
 Samuel Barrett
 x John Ridgway
 x Nancy Lewis
 x Dr. Gilbert Dench
 Sept. 1. Mr. Hartwick
 2. x Benjamin Hatch
 x Daniel Ward
 x Mary Ridgway
 Nancy Armstrong
 3. x Susanna Patten
 4. x William Woods
 x Elizabeth Colman
 5. x Betfy Ridgway
 6. Patty Cockran
 7. x Samuel Coats
 x John Bull
 x James Eaton
 x Eunice Whipple
 8. x Ralph Pope
 x John Merry
 Lydia Wetherton
 x Mrs. Cooke
 Joseph Joyce
 10. x Susanna Johnson
 x Clement Collins
 ——— Pownal
 11. x Charles Moore
 x George Carey
 Phebe Averhill
 12. x Joseph Balch
 x Esther Baxter
 x Mrs. Flinn
 Job Wheelwright
 Chow Mandarin
 13. x ——— Spear
 x Abigail Bumstead

- Sept. 13. x — Sprague
x Temperance Colman
15. x Clarissa Rogers
x Mrs. Bromit
16. Philip Boston (Black)
x Joseph Tennis
17. x Benjamin James
x Mrs. — a Stranger
x John Pindergrafs
18. x Mary Thayer
x Mary Harris
x Mrs. Service
x John Joy
19. x Thomas Webb
x John Menzie
x Mrs. Foxwell
x Eleonora Gere
—— Berry
20. x Edward Davis, junr.
x Samuel Hunt
x Elizabeth Jamison
21. ——— Tuckerman
x Eleonora Berry
x Rebecca Nichols
x ——— Smallpiece
x Eliza Fessenden
22. x Richard Fox
x Thomas Simmons
(Black)
x ——— Shaw
x Hannah Reynolds
23. x Kitty Lambert
x Ruth Thayer
x John Bryant
24. x George Lishermore
x Samuel Speare
x Margaret Spear
x William Menzies
x John French
x ——— Emery
25. Elizabeth Durant
x Sarah Snow
x Miss Fishby
x Alexander Laurad
x Mehetabel Lolly
x Mrs. Poore
26. Mary Walter

- Sept. 26. x Betsey Rowse
Rose Brewer (Black)
x A Woman from Capt.
West's
x A Woman from
Fitch's Alley
x Moses Haskell
27. x Noah Wiswall
x Sarah Piper
x Alexander Edwards
Eleonora Reed
28. x Sally Thomas
Mrs. Glyde
x 2 Names unknown
x Mary Huntley
Mary Armstrong
x ——— Harris
29. x Gardner Baker
x Rachel Conant
Ebenezer Stone
30. x James Boyd
x Nancy Howe
x Thomas Crawford
- Oct. 1. x Benjamin Bolter
x William Heath
x ——— Menzie
x Josiah Bradlee
2. x A Person from Mid-
dle-Street
x Ditto from ditto
x Mr. Crane
Ann Patshall
Elizabeth Head
3. Elizabeth Magner
4. x Sarah Brailsford
x Ebed Sprague
Watey M'Night
5. ——— Hamilton
x Thomas Orrifond
Patty Wheeler
6. A Woman from John
Geyer's
7. Widow Tufts
Sarah French
x Mrs. Perkins
x Charity (a Black)
x Mrs. Tough

- Oct. 7. Mrs. Oriphant
 xG. Cotting
 8. Charles Waller
 A Man from Mr.
 Gooche's
 xAbigail Dyer
 9. xWilliam Dyer
 xA Man from Fifth-
 Street
 10. xRebecca Clarke
 xArad Brown
 xC. Briggs
 xIsaac Smith
 R. Masters
 John Barry
 xMiss Jarret
 xOne unknown
 xMrs. Tufts
 11. — Bull
 12. xNathaniel Peabody
 John Roby
 xJoseph Shaw
 xWilliam Harrison
 xA young Woman at
 Mrs. Donnison's
 17. xHannah Cristie

- Oct. 18. ——— Trask
 Sufannan Read
 21. xThomas Cristie
 xMrs. Marsh
 Martha M'Clintock
 22. Mrs. Rhodes
 24. Miss Vincent
 31. Elizabeth Minchen
 Nov. 3. ——— Shaw
 ——— Bartlett
 5. Mary Palmer
 Polly Williams
 6. Polly Russell
 Elizabeth Barrett
 7. Mary-Ann Townsend
 Elizabeth Ankers
 William Larkin
 8. xA Woman from Proc-
 tor's Lane
 xThomas Patten
 Robert Davis
 9. xEunice Patten
 10. xJohn Apthorp
 11. Bethiah Williams
 12. Aaron May
 Stephen French